Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

VOL. VIII.—NO. 25. (NEW SERIES.)

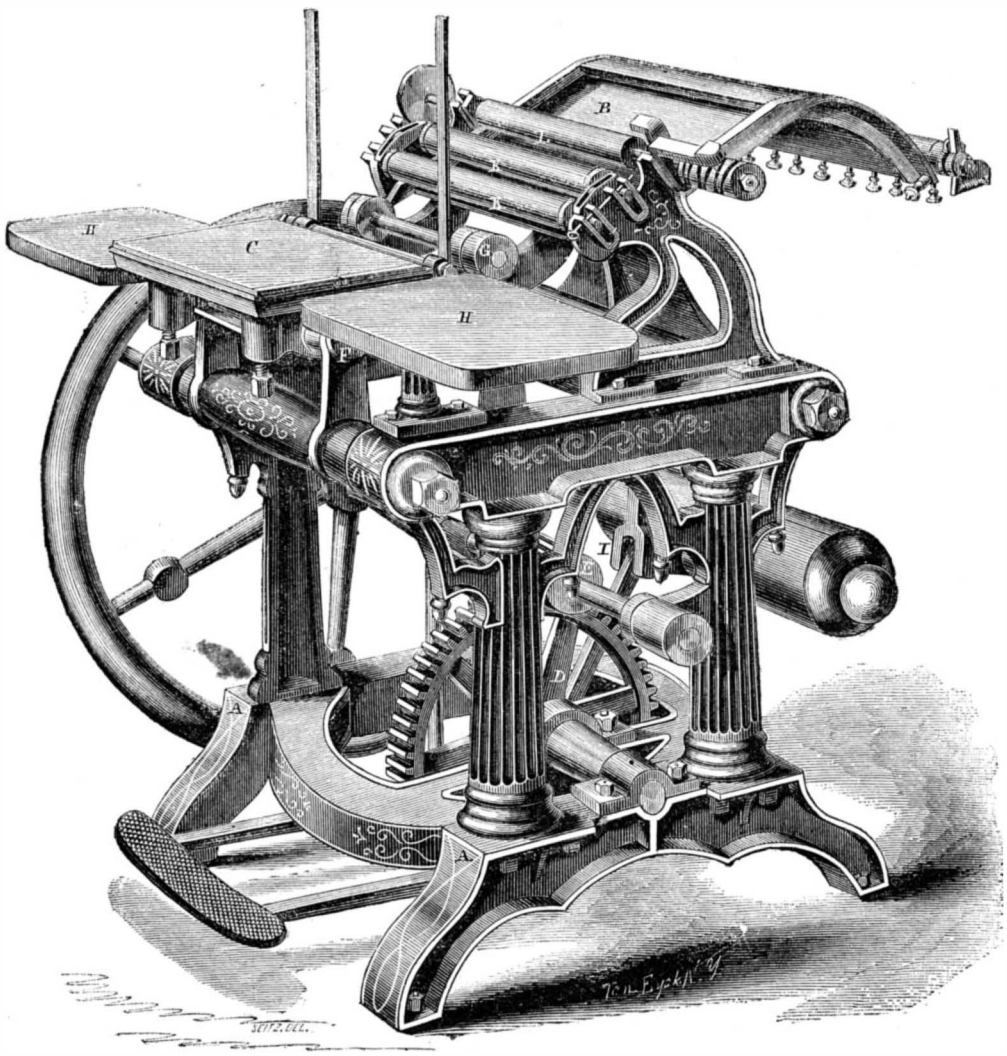
NEW YORK, JUNE 20, 1863.

SINGLE COPIES SIX CENTS. $3 PER ANNUM—IN ADVANCE.

Improved Printing Press.

Among the many instances in which American inventive genius has caused the nimble and accurate fingers of mechanism to displace the tedious processes of hand labor, the printing of cards, circulars, and other small work, holds a prominent position. Small power presses, of fine finish and capable of better work than could be done by the old hand-press, are to be found in operation in all parts of this country, and no printing-office is supposed to be in a condition to do business without one or more of those useful machines; but abroad they are almost unknown, even in the larger cities. What formerly required the labor of an expert man and boy for a day is now rattled off in much better style by the boy alone in two hours.

The elegant-looking machine we herewith illustrate is one of the latest improvements in this class of printing presses; it is distinguished alike for its simplicity and the quality of the work which it executes. The forms are placed upon the bed, B, which receives a rocking motion on a shaft fixed in the framing, A, through the arm, I, and a wrist-pin in the large wheel, D. This wheel receives its motion through the pinion, E, and treadle in a manner obvious to the mechanical reader. As the bed, B, oscillates, carrying with it the "form" of type, it passes beneath the inking rollers, K K, which supply the proper amount of ink for an impression. The curved table shown on the bed, and the fountain thereto attached, furnish the rollers with the requisite quantity of ink, which the vibrating roller, L, causes to be evenly "distributed;" all of which is done by the simple motion of the bed.



POTTER'S IMPROVED PRINTING PRESS.

The paper to be printed is placed upon the "platen," C. This platen is hinged by strong arms to the bed, B, at the point, G, and is also jointed at the point, F, to arms extending from a shaft fitted to turn in the frame opposite the shaft of the bed. As the bed, therefore, is caused to oscillate, the platen is forced to go with it, and, by the action of the joints, to close upon the "form" thereon placed. As the joint, F, comes into line with the two centers of oscillation, a powerful increasing leverage is developed, thus giving the "impression." As the parts return to the condition shown in the drawing, he platen, C, assumes the horizontal position, so hat the printed sheet can be removed and another ne substituted, while the form receives a fresh supply of ink. An adjustable "frisket" is operated by positive mechanism, not represented in the cut, to close upon the sheet, hold it in place, and remove it from the type. H H are tables to receive the paper both before and after being printed. Among the advantages claimed for this press are great simplicity in the arrangement and number of parts, and consequent little liability to derangement or wear; a strong and fair impression equal in all parts, and no liability to "slur;" a perfect "distribution" of the ink, and ease of access to the inking rollers. The bed is never carried beyond the perpendicular, and, when in the position shown in the cut, is convenient for receiving and correcting the form. The paper, ink-rollers, and form, are, except at the moment of impression, in full view of the operator. A patent for this invention was granted to G. H. Babcock, on Dec. 23, 1856, but recent improvements have been made by the manufacturer in 1863. Further information may be obtained by addressing the manufacturer, Charles Potter, Jr., at Westerly, R. I.

EMIGRATION has been extremely active of late from Ireland, and troops of the new importations, both male and female, can be seen in our streets.

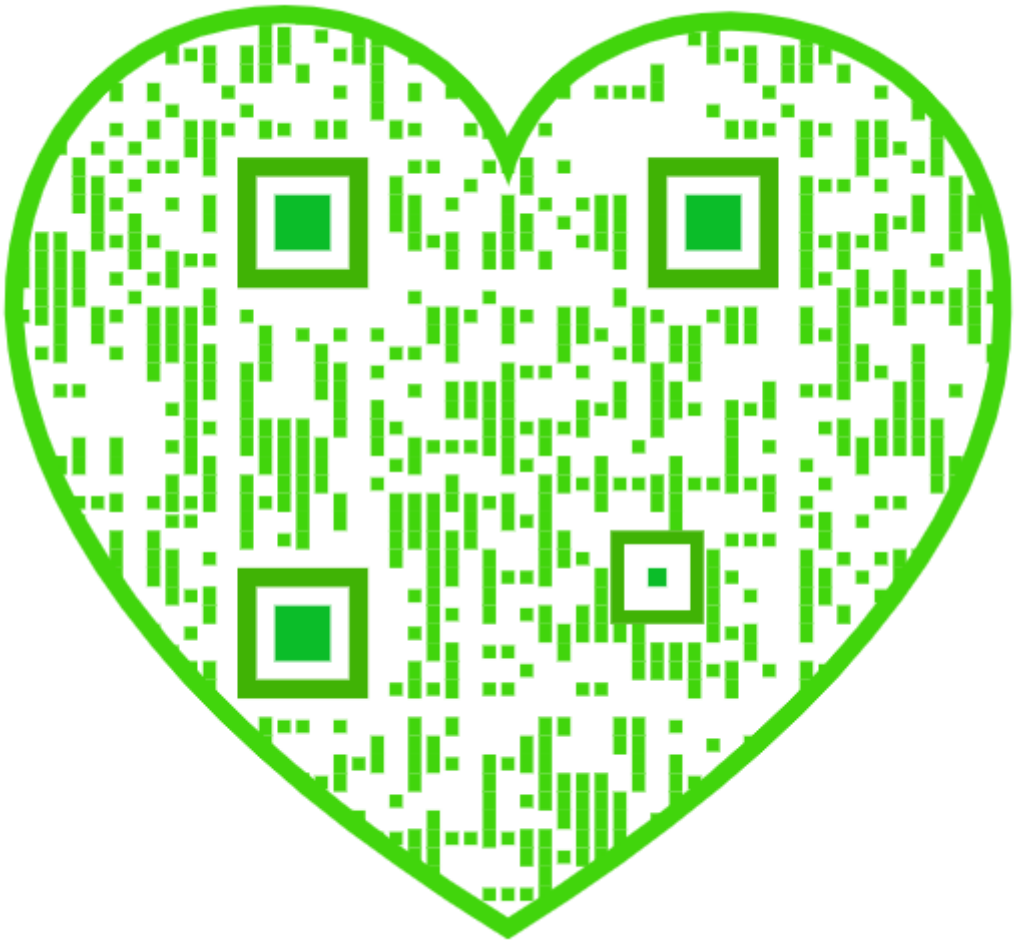
The Pistons of Portable Engines.

A form of piston early adopted in portable engines consisted of a simple ring of brass, cast-iron, or steel, cut through at one place, in such a manner that no direct joint existed parallel with the piston-rod. This ring was forced against the cylinder by its own elasticity, aided by that of a circular steel spring, coiled up within it. The body of the piston was made in two parts, which, when put together and made fast on the rod by a nut, left a suitable groove between them for the packing ring. This piston was moderately simple, and has done good service; its great defect being wear at the edges of the ring, owing to which, in a year or so, it becomes too narrow for the groove, and permits the body of the piston to slip within it at each stroke, leading not only to its gradual destruction, but early permitting an excessive leakage between the ring and the body of the piston; two rings of the same kind have been employed in the length of the pistons with no better results. This piston may be daily met with still, and being very cheap, seems likely to hold its place.

The "Swedish" piston has given much satisfaction when employed in locomotives, and would be worth a trial in portable engines. It consists of a solid body, in which two grooves, about half an inch square in section, are turned; into each groove is sprung a plain cast-iron ring, cut straight across at one place, the elasticity of the rings giving all the spring necessary to make the piston tight. It is said to wear very well, but seems to us to be open in some degree to the same objection that applies to the last.

Ramsbottom's piston has lately met with much favor for locomotives. It consists of a solid cast-iron body, into which three square grooves are turned, varying in depth and width with the size of the piston. In ordinary "portables" these grooves measure about one-fourth of an inch each way; into these are sprung square wire rings, made of mild steel, of such a size that they fit the groove loosely, making a tight piston by their own elasticity. However well these pistons answer in locomotives, where the rings are much stronger, and are frequently examined and replaced by skilled hands, they are quite unsuitable for agricultural engines, being subject to rapid wear from the very small rubbing surface they offer to the cylinder. We have seen a set worn out in less than a month; they seldom last two; and in

© 1863 SCIENTIFIC AMERICAN, INC.



addition, are very liable to turn round on the piston, so that one end sometimes springs into the port, invariably breaking the piston as a result. It has been urged that the nominal cost of these rings, and the ease with which they can be replaced, constitute important advantages. All this we admit, when the engine is placed in skillful hands; but we have never met with an agricultural laborer who was competent to the task; the agricultural laborer and the agricultural engine invariably go together, and as these engines frequently find their way into remote districts, the inconvenience and expense of sending for a properly qualified person is sufficiently obvious to prevent their general adoption. Besides, these rings are very apt to set fast in the piston if bad oil is admitted to the cylinder; in which case, of course, the piston becomes a mere solid block; *apropos* of which we may mention that a solid piston was introduced a few years ago, constructed on the following principles:—The inside of the cylinder is very accurately bored, and the piston turned so as to be a very accurate fit; a few shallow grooves are then turned in it, in which a little water lodges, and is said to make the piston perfectly tight. [This was tried in Lee & Larned's steam fire-engine, and discarded as useless and impracticable.—Eds. of the Scientific American.]

A very excellent piston is made thus:—A body is cast in two parts, turned, and fitted on the rod, so that when secured with a nut and lock-nut, they leave a groove between them; for a 10-inch piston, three-fourths of an inch deep, and two inches wide. A short cylinder of hard, tough, cast iron, of suitable size, is then chucked in a lathe, and has three rings successively cut from it. The external diameter of these rings is about half an inch greater than the bore of the cylinder. Two of them are turned with one straight and one sloping side, so that the cross section resembles a right-angled triangle with part of the apex cut off, the rings being about $\frac{5}{8}$ of an inch thick, $\frac{3}{4}$ of an inch wide, on the outside, and $\frac{1}{2}$ an inch wide on the inside. Our readers will understand that these rings are placed in the groove of the piston in such a way that the straight side of each comes against the top and bottom plates respectively of the piston, leaving a space between them $\frac{1}{2}$ an inch wide next the cylinder, and 1 inch wide next the body of the piston. The third packing ring is turned so as exactly to fill this space when put in position between the other two; its cross section being that of an isosceles triangle with the apex cut off, 1 inch wide next the body of the piston, $\frac{1}{2}$ inch wide next the cylinder, and $\frac{5}{8}$ of an inch thick; various other relative dimensions may be employed, but these will answer the purpose of illustration. The effect of the arrangement is that the middle ring, presenting but $\frac{1}{2}$ an inch of surface to the cylinder, wears away much faster than the other rings which present $\frac{3}{4}$ of an inch each, and consequently, pressing outwards, forces the other two rings laterally, owing to its wedge shape, against the top and bottom plates of the piston, so as to effectually provide for end as well as surface wear. We have said that the rings are made larger than the cylinder, and when finished they have just so much cut out of their circumference as will permit the ends just to meet when placed in the cylinder. Their own elasticity is found amply sufficient to press them against the cylinder, so as to be perfectly steam-tight. The middle ring is sometimes made of brass—an unnecessary refinement.

All things considered, we do not believe a better packing for pistons up to 30 inches diameter can be adopted. From the strength of the rings, it is almost impossible to set them fast; indeed, it is difficult to see how any foreign substance can force its way between them. Once ground slightly together, they always remain in steam-tight contact until completely worn out. The piston is cheap, strong, durable, and unpatented; indeed we believe it be a very old invention. It deserves far more general adoption than it has hitherto met with.

Proprietors of portable engines would do well to remove the back lid, and thoroughly coat the inside of the cylinder with good tallow while it is yet warm, if there is any chance of the engine standing idle for a few months. The increased durability of the piston will well repay the extra trouble. Where the engine-driver is intelligent, he might soon learn to remove the piston and clean and oil it from time to time, thus preventing much of the mischief and expense too often incurred by want of care and attention on his part.—*London Mechanics' Magazine.*

The Turkish Industrial Exhibition.

The example set by most of the civilized nations on the globe, of originating industrial exhibitions has been at last emulated by the Turks; and the Ottomans, awakening from their lethargy, have plunged headlong into an inspection of the wonders of their own country; the various products having been gathered into a large building for the purpose of exhibition. The collection was not greatly varied, if we may judge from the following account, furnished by a correspondent of the New York *Observer*:—

"We have 'done' the Exhibition. We spent several hours in the examination of all the accumulated wealth and wonders of the empire, from the crown jewels of the Mahomets, Selims, and Abdul Azizs, down to the extraordinary bread and cheese, pickles and wax of the nearest *charsheh* or market.

"The building appropriated to the Fair is a large square edifice of wood with a glass dome; it is gaily decorated with flags and streamers, and guarded from without by white-turbaned and scarlet-trowsered soldiers. Three piastres a head to the man at the door, and we are inside, fairly overpowered for the moment by the beauty and novelty of a scene which we had not considered it possible to find in Turkeydom. Which way shall we turn?—for we are so bewildered by the brilliant *coup d' œil* produced by the endless number of pillars wreathed round or festooned with the rich, bright carpets of the Orient; the pretty fountain and gay parterre in the center of the building; the piles of showy silks of Damascus and Persia, and the delicate gauzes of Broosa; the resplendent embroidery of the harems; the huge bear-skins and waving ostrich plumes; the pearl-wrought slippers and the burnished armor—that we know not how or where to commence our investigations. A few minutes, however, suffice to restore us to our senses, and we are about going systematically to work, beginning at our right hand, when a gay voice summons us to the upper end of the building. We remonstrate to no purpose. We 'must go and see the jewels first.' Everybody is eagerly examining them, and they are splendid, certainly, but as we are staunch republicans, you cannot expect us to go into raptures over such insane ensigns of royalty. Suffice it to say that there were immense diamonds of the first water, by the handfuls, and pearls of incomparable purity and size, all these with turquoises, rubies and emeralds, set in magnificent brooches, coronets, necklaces, bracelets, and aigrettes; one of the latter being the identical ornament worn by Mahomet II. at his triumphal entry into Constantinople. Then there were superb diamond-inlaid amber mouthpieces, and richly-jeweled scimetars; exquisitely chaste and be-gemmed *zaruffs* for holding the *fingans* or tiny Turkish coffee cups; and monstrous unset emeralds, some of the shape and size of an egg, and an uncut one—a large, flat, oblong stone—weighing 1,090 drachms! It was a fortune in itself.

"Of those paintings which attracted principal attention were two portraits of Mahmoud, the one taken in his Oriental turban and flowing robes, in which he is represented as standing in his palace, with his foot on the armor of a headless janissary, pointing to it as if saying—'In this lies my history.' In the other, a life-sized portrait, the victorious monarch is riding forth, sword in hand, mounted on a powerful and fiery charger, and attended by a brilliant suite. His costume is scarlet and white, a military dress, half European, with the distinctive fez and Spanish mantle peculiar to himself and his son Abdul Aziz, the present Sultan. The pose of both horse and rider is most spirited, magnificently real. You see the impetuous yet lofty ardor that flashes in the eye and animates the whole figure of the monarch; you hear the snort of defiance of the high-mettled Arabian, as he arches his proud neck and rears to the tightening of the bit. In the same corner, called by courtesy the 'picture gallery' of the Exhibition, were many fine photographic views of the city and Bosphorus, taken by native artists, principally Armenians, among whom the Abdullah Freres are first. There was also quite a collection of fancy paintings and etchings, mostly of a very inferior class, however, but we were greatly surprised to see among them a picture representing the first celebration of the 'Lord's Supper.' The fact of its hanging up there to the gaze of Mussulmans was a significant comment on the liberal spirit of the times.

"But passing on from here, we must not forget to mention the large, handsome brass *mangals*, of which there were a great number and variety; said *mangals* being used, as everybody knows, to contain live coals for heating the apartments in native houses. There were elegant specimens of ornamental chirography, in which the Turks excel; the 'Tomb of Napoleon at St. Helena,' cenotaph and acacia trees, made of hair, the whole evidently an ambitious advertisement of some enterprising *peruquier* in Pera; models of bridges and dock-yards; enormous sponges, still clinging to pieces of their native rock; coal and other minerals, of which there might be a much more valuable collection; and last, but not least, an American sewing machine! 'Wheeler & Wilson' was not in operation the day we visited the Exhibition, but it is worked three times a week to the admiring gaze of the Mussulman ladies, who throng the building by thousands. Mondays, Thursdays and Saturdays are now specially devoted to them, as it is found that the expenses of the Exhibition are not likely to be defrayed by depending too much on the curiosity of the Giaours.

"Most of the articles in the Fair have already found purchasers, particularly the carpets, which were in great demand. The largest of those contained forty-five square yards, and was a whole year in process of making.

"The *Annexe* is a new wing added to the building, and contains only machinery, principally of English and French invention. The United States, I learn, is represented by 'Armsby's patent, small, Yankee corn-sheller, exhibited by Nourse, Mason & Co., of Boston;' also a variety of spades, hoes, shovels, hay forks, &c."

Military Clothing.

The question of uniform is one of great importance, not only in a hygienical but also in a strategical point of view. The uniform ought to protect the soldier against atmospherical changes, at the same time that it should not interfere with freedom of movement, or interpose any obstacle to marching, running, leaping, and the free handling of his arms. The fate of a battle, the character of a retreat, the death list of an army, may, to a certain extent, depend on the cut of a coat or of a head gear. The soldier's clothing ought, like that of other citizens, to be modified according to season, climate, localities, &c. His equipment deserves particular attention. A soldier in the infantry, when on a march, in time of war, carries a weight equal to or within a few ounces of 60 pounds, to which must be added, under certain circumstances, nearly $4\frac{1}{2}$ pounds of provisions. All of this is borne chiefly on the shoulders and chest, whence follow impeded movements in expansion of the chest and in the function of respiration generally, profuse sweating, muscular fatigue, and rapid exhaustion. The infantry being that arm of the service which has to endure the greatest fatigue, ought to be composed of strong and robust men. In selecting men for infantry service less attention should be paid to the height than to the fullness of the chest and of the muscular system; experience having shown that individuals of short stature, but well formed and endowed with a certain degree of muscular strength, are the least liable to suffer from fatigue and disease.

Wool in England.

As the quantity of wool in England greatly controls prices in America, it is interesting to know the amount which has arrived in that country this year. During the first three months of the year 19,644,964 pounds arrived in England from colonial possessions, against 14,224,823 pounds for the corresponding period in 1862. Of this amount 7,228,887 pounds had been sold and exported, against 8,780,157 for the corresponding period of the previous year. The great amount thus left on hand has led to a decline of about three cents on the pound, and it is supposed that there will be a further fall. The total amount of colonial and British wool exported to the United States in those months amounted to 1,858,506 pounds.

© 1863 SCIENTIFIC AMERICAN, INC.

New Form of Dry Per-sulphate of Iron.

The following is from the *American Journal of Pharmacy*, communicated by Dr. J. Lawrence Smith, of the Louisville (Ky.) Chemical Works :—

"The use of the per-sulphate of iron has been very much extended in the last few years, and various formulæ have been proposed for making it, all of which are very good. But it is not in forming the solution that there is any thing needed, but it is the transformation of it into a solid that is most desired. Some have dried it on plates in a hot-chamber, and others have dried it by the direct application of heat, giving it a porous structure not unlike tannic acid when first dried. I have given to it these forms successively, but they all have objections. Heated on plates, if the temperature be too light or continued too great a length of time, a portion becomes insoluble, other forms are deliquescent and soon become moist in contact with the air. Having succeeeded in drying it into an almost impalpable powder unalterable in contact with the air and very soluble in water, I propose describing, as near as possible, the method by which this is arrived at. As regards the solution of per-sulphate I am not very particular about the the formula, preferring, however, one proposed for Monsel's per-sulphate (sulphate of iron, 100 troy ounces; distilled water, 2 gallons; sulphuric acid, 5 troy ounces; nitric acid, 5 troy ounces or q. s.), for per-oxidizing the iron, when the whole is brought to the boiling temperature. The manner of doing this is familiar to all operators. The solution is allowed to cool somewhat, then filtered and concentrated to a density of 1.60. It is now allowed to cool and poured into shallow plates to the depth of one-sixteenth or one-fourth of an inch, and a little of the dry powder obtained from a previous desiccation is scattered on the surface of the liquid in each plate. The plates are then placed on shelves in a part of the laboratory where a little steam is escaping and the temperature is from 75° to 100° Fah., according to the season.

"In my works shelves are constructed two or three feet above a series of steam jackets in which live steam is used, and always more or less escaping from the sides of the jackets. In from twenty-four to forty-eight hours the contents of each plate begin to rise in cauliflower excrescences that after a little longer exposure become dry, and rub down between the fingers to an impalpable powder; and when rubbed down and passed through a tolerably fine iron sieve, it has very much the appearance of mustard. It can be exposed to the air without its absorbing moisture or undergoing any alteration. When thrown into water the water becomes turbid, but in a few moments clears up, affording a red solution. It is soluble in a very small quantity of water. When it is desired to use it in the solid form as a styptic, it can be taken in the fingers and scattered on the wound or other surface as any other powder may be applied. This manner of drying a substance considered deliquescent doubtless appears a very singular one, and it certainly was not suggested by any train of reasoning, but discovered altogether by accident, and I have tried to bring about the result by other arrangements; but the solution placed on shelves in the same room not more than ten feet off, but not exactly under the same condition of vapor and temperature, acts entirely differently; the solution, instead of drying, becomes more dilute from absorption of moisture. In the drying-room proper it solidifies into a hard mass."

The Western Iron-clads under Fire.

Chief Engineer John W. Hartupee, of the iron-clad *Tuscumbia*, is responsible for the following statement of the manner in which his vessel stood fire at Grand Gulf, Miss.:—

"The engagement lasted five and a half hours. The *Tuscumbia* received eighty-two solid shots, and it is impossible to count the shells that exploded in her. The upper work is a perfect wreck. No man could have lived on her deck for a minute. It is believed here that we were under the heaviest fire ever known in naval warfare. The rebels concentrated all their fire on us for at least two hours. More than one-half the time during the fight we were not more than fifty yards from the muzzles of thirty guns, and some of these guns were 100-pounder Parrotts—a gun which throws projectiles with greater force than any gun now in use. But all would not do. They could not penetrate the iron sides of the *Tuscumbia*. We received more shots than all the other vessels combined; but our plating proved perfectly invulnerable against all efforts to penetrate it. There was one great blunder committed in building the *Tuscumbia*, and that is in the location of her magazine. To give you an idea of this, I will just say that in action the hatches of the magazine are necessarily left open. When the shell exploded in her turret the fire from it badly burnt the face of the boy who was stationed at the door of the magazine to pass powder up. This will be altered before the vessel is pronounced fit for action again. You must not think that the *Tuscumbia* is disabled beyond repair. She will soon be ready to 'go in' again. We took 490 prisoners. Since the fight we have buried three men, who died from the wounds received, making, in all, eight killed."

Autograph Letter of Benjamin West.

We find the following in the San Francisco *Bulletin*:—"An interesting memento of the celebrated American painter, Benjamin West, in the form of an autograph letter, is now in this city. This letter is dated Newman street, London, March 20, 1813, and is addressed to Joshua Shaw, an eminent painter, then residing in Philadelphia. In this letter Mr. West mentions that his great painting of 'Death on the Pale Horse' was then on successful exhibition in London; also, the pleasure which the reception of his gift to the Philadelphia Hospital—his painting of 'Christ in the Temple''—had given him. As a remembrance of Benjamin West, who has been often called the 'father of American painters,' this letter is very valuable; and its possession has been much desired by various literary institutions in the Eastern States; but the descendants of Mr. Shaw (of whom there are several in this city) value it greatly as a family heirloom. Joshua Shaw was quite a notable painter in Philadelphia. He was the inventor of many improvements in gun-locks, and also the inventor of the percussion lock and cap, and a water primer for cannon. These inventions were adopted by the United States Government, from which a large amount is now due to the heirs of Mr. Shaw, who died in 1860."

Hints on Bread-making.

Good bread cannot be made by merely mixing flour and water and yeast. The mass must be kneaded so as to be sure and bring every grain of flour in contact with its equivalent grain of water, and so as to diffuse the yeast uniformly throughout the mass, or else the resulting gas will be liberated in excess in one spot and not at all in another. This is seen in badly-kneaded loaves—in the holes they contain and in a crust that easily detaches from the crumb, as though it had been lifted up by internal force. The air cells in a well-kneaded loaf are fine and uniform throughout the mass and all will be formed at the same time. If the flour and yeast are decidedly good and the kneading decidedly bad, the bread will not give satisfaction. On the other hand, good kneading, good molding and good baking, will make a second or third-rate quality of flour almost equal to the best.

MISCELLANEOUS SUMMARY.

Axle-boxes and pistons are stamped out, in Germany, from solid heated blocks of iron; and in England the driving wheels of locomotives are stamped out from solid plates. Hydraulic pressure is employed for operating the punching machines.

To give Ham a Smoky Taste.—Ham that is deficient in the smoky flavor may be improved by dipping it in tar vinegar before broiling it. Tar vinegar is made by taking equal parts of both substances and pouring the vinegar on to the tar. After a few minutes of contact pour the vinegar off and use as above.

Some idea may be formed of the tremendous consumption of the munitions of war, which the rebellion has occasioned, by the fact that the Waterbury Cap and Flask Company alone made, during the past year, over 100 tuns, or 200,000 lbs., of copper into percussion caps.

The head of a carrot, if cut off a little below the top and put into a basin of water, will send out leaves, and make a handsome ornament.

Mr. L. A. Edgell, of Burlington, Vt., is now engaged in the manufacture of tar and turpentine from pitch pine stumps—an enterprise which was started last fall. He expects shortly to be able to turn out over 300 gallons of tar and 100 gallons of turpentine per week. The distillation also produces, in considerable quantity, pyroligneous acid, a substance used in print mills for setting colors.

Great Benefits of Labor-saving Machinery.—By the aid of improved machinery, one man can now spin four hundred times more cotton yarn than the best cotton-spinner could in 1769, when Arkwright took out his first patent. In grinding grain and making flour, one man can now do one hundred and fifty times more work than he could a century ago. One woman can now manufacture as much lace in a day as a hundred women could a hundred years ago. It now requires as many days to refine sugar as it did months thirty years ago. Only forty minutes are now required to fix an amalgam of mercury and tin on a large looking-glass, which once occupied six weeks. The engines of a first-class iron-clad frigate perform as much work in twenty-four hours as 42,000 horses.

NEW YORK MARKETS.

The following is a statement of the wholesale prices of certain articles of commerce in New York on the 10th inst.:—

Coal.—The price of anthracite coal ranges from $7 to $8 per tun of 2,000 lbs.

Coffee.—Coffee costs from 20½ cents per lb. for inferior St. Domingo to 37 cents for Java; the retail price of the latter is 40 cents.

Copper.—Sheathing is 42c. per lb.; ingot 30½c.

Cordage.—American tarred cordage is 16c. per lb.

Cotton.—The price of cotton varies from 38c. to 61c. per b. for "middling fair."

Domestic Goods.—Brown shirting costs from 20c. to 25c. per yard; bleached heavy shirtings, 24c. to 28c.; brown sheetings, 24c. to 25c.; bleached sheetings, 24c. to 25c.; bleached drillings, 25c. to 30c.; narrow cloth, all wool, $1 50 to $2 75; cassimers, $1 06 to $1 50; satinets, 75c. to 85c.; cotton flannel, 25c. to 30c.; woolen flannel, 75c. to 85c.; printingcloth—narrow and wide, 9c. to 11c. The variety of cotton and woolen cloths is so great that we do not specify each sort. At present the prices of cotton goods are lower than they were a month ago. Several of our large cotton factories that were engaged in the manufacture of fine goods have been closed for several months. It is expected that prices will rise, unless cotton falls.

Flax.—The price of flax ranges from 16c. to 22c. per lb.

Flour.—Flour ranges from $5 25 to $9 25 per barrel; rye, $4 to $5 25; corn meal, $4 to $4 58. Considering the great rise in the price of most articles, flour is comparatively cheap.

Grain.—Wheat is selling at from $1 22 to $1 75 per bushel; the lowest is Western spring wheat; the highest Missouri winter.

Hay.—Hay is selling at 90c. per 100 lbs.

Hides.—Green salted sells for 13c. per lb.; slaughter, 9½c.; dry Rio Grande, from 20c. to 25½c. The prices for foreign hides have a very great range.

Hops.—Hops of last year's crop are sold at from 18c. to 22c. per lb.

Iron.—American pig iron is selling at from $33 to $34 per tun; Scotch pig iron, $33 to $34; English bar iron, $76 to 87 50; sheet-iron ranges from 5½c. to 6¼c. per lb.

Lead.—"Galena" costs $8 50 per 100 lbs; English refined, $8 50; pipe and sheet, 12c. per lb.

Leather.—Oak-tanned sole-leather ranges from 25 to 40 cents per lb.; hemlock tanned leather ranges from 23c. to 27c.; rough upper leather at 40c., and fine as high as $1.

Molasses.—This article is selling at from 42c. to 50c. per gallon.

Nails.—Cut nails cost from $5 to $5 25 per 100 lbs.; horseshoe nails, 26c. to 30c. per lb.

Naval Stores.—The price of turpentine spirits is $3 40 per gallon; rosin costs from $22 to $32 50 per barrel of 280 lbs.

Oils.—Linseed oil is selling at $1 18 to $1 20 per gallon; whale at 88c. to $2; refined petroleum, 50c.; lard, 85c.

Paints.—White lead, pure, ground in oil, costs 11c. per lb.; dry, 10c.; zinc white, in oil, 8c.; red lead, 11c.

Provisions.—Some mess beef is selling as low as $4 50 per barrel; the best India as high as $28; Pork costs from $10 to $15 50 per barrel; hams from 4½c. to 10c. per lb.; butter, from 16c to 30c.; cheese, from 8c. to 11c.

Rice.—East India, dressed, sells at from $5 25 to $6 25 per 100 lbs.

Steel.—The price of English fine steel ranges from 20c. to 29c. per lb.; German, 10c. to 17c.; English spring, 8c. to 15c.; American blister, 5½c. to 6¼c.

Sugar.—Sugar ranges from 7¾c. to 15c., per lb., for "Stuart's loaf."

Tea.—The price of tea varies from 35c. to $1 35 per lb. The names of all the teas at present offered for sale in the New York markets would fill a column of the Scientific American.

Tin.—Tin costs from 50c. to 55c. per lb.: charcoal plates from $8 50 to $12 50 per box.

Tobacco.—Tobacco is selling at from 12c. to 90c. per lb. for plugs; cigar tobacco from 45c. to $2 per lb.

Wool.—American "Saxony" fleece can be bought at from 80c. to 82c. per lb.; Merino, 65c. to 80c.; California (washed and unwashed), 25c. to 50c. Foreign wools range from 18c. to 60c. per lb. There has been and there is still a great demand for wool. All the woolen cloth and flannel factories are driven to their utmost speed, and several of them are running day and night.

From the 1st of June up to the 10th inst. 4,095 bales of cotton arrived in New York. The increased receipts have been from the Department of Gen. Banks in Louisiana.

The "'longshoremen" of New York are on a strike for wages. The wharves at which the California vessels lie are crowded with freight; but the 'longshoremen seem to rule that department, as they will not permit any one to put freight on board.

© 1863 SCIENTIFIC AMERICAN, INC.

THE WATERBURY BRASS MILLS.

The Waterbury Clock Company---The American Cap and Flask Company.

There is hardly a household in the land that has not upon its mantel a little monitor, with wheels of brass, that reminds the inmates how swiftly time is passing away. One has only to imagine all the clocks and watches of the world suddenly stopped or out of order, to see what an utter derangement would take place. The confusion of tongues at the Tower of Babel would be hardly greater than the distress and dismay of mankind without their time-pieces, and since all the important events of life are generally appointed for certain hours of the day or night, we can see at once that the machines which measure those hours must be well made and wholly reliable. That the Yankee clocks comprise all these requisites is a well-known fact, and we shall dilate a little upon the method by which they are made.

It is not difficult to produce a combination of machinery that approximates to correctness and will run if well overlooked and sent to a clockmaker once a month in order to be regulated; or, if we spend a great deal of time in elaborating costly and delicate parts we shall also produce a good clock, but not at a price within the reach of all. For a complete and harmonious system of making time-pieces (more particularly watches) commend us to the American Watch Company at Waltham, Mass., and the Clock Company at Waterbury, Conn. Anything like the precision and accuracy attained by the diminutive tools used at the watch factory has never fallen under our notice before, and the popularity of the watches therein made is—to the good sense of our countrymen be it said—increasing daily; commend us to the Watch Company for a beautiful and an accurate time-keeper for the pocket, and to the Clock Company for one of larger dimensions.

In one of the large rooms in Benedict and Burnham's factory we found the Waterbury Clock Company in full operation, turning out clocks for the world. If the reader has one upon his shelf, as doubtless he has, he will see that the works or train are contained between two brass plates or a frame. This frame is stamped or cut out of a sheet of brass of the proper thickness, and is then drilled for the reception of the shafts or pivots of the wheels which work between it. The shafts—such they are in reality—are cut from wire specially prepared for the purpose; they are then placed in a lathe and the bearings turned up. The turner has a stock in which two tools are made fast, and this stock is further fitted with two stops that come in contact with the rest on which the tool rides. This stock and the tools are brought up to the shaft running in the lathe and moved along until the stop strikes the rest. When this occurs the tool can go no further, and by performing a similar operation on the other end of the shaft, the length between the two shoulders is secured. The diameter of the bearing is also attained at the same time and the surface of it rendered smooth by burnishing. These processes are done very quickly. The wheels of the clock are stamped out of a brass sheet. The blank is first cut out round, and the spaces between the arms of the wheel are punched subsequently. The wheels are then put on to a mandrel and turned up in an engine lathe to an exact size; they are then ready to be transferred to the cutting engine which makes the teeth. These machines are so familiar to all our mechanical readers that we shall not advert to them here; and when we say that nearly all parts of the clock are stamped out of sheet brass and afterwards made true by skillful workmen at various tools, we give a fair idea of the way in which brass clocks are made. The shafts, pinions, &c., are all nicely adjusted in their places and the clocks when finished do not fail to keep excellent time.

In another building, belonging to the Clock Company, we saw the operation of making the dial plates and of transferring engravings or prints to the ornamented glasses in front of the clocks. This latter process is well known to most persons. The dials are made of sheet zinc and are painted with white zinc paint; after the primary coat has dried the dials are placed on a revolving plate and ground perfectly smooth, and are also highly polished by the application of pumice-stone and water. The fine surface thus produced is to be printed with the hours and minutes of the day, and for this purpose it is put into a press and impressed with all the figures at one operation. This task was formerly done by hand and was a tedious process. When the clock movements are ready and the dials finished, it only remains to furnish the cases which protect them from injury. The cases are made in all styles and of all varieties of wood. The outside is veneered in a tasteful manner, and the eight-day clock is at once a beautiful and a useful article. A large amount of lumber is used in this branch of the business, and we were shown lofts where all the hours of all the days of people in every part of the globe were lying in readiness to be recorded, so that they might make the register of human life complete.

It was indeed a sight that one could scarcely look upon without being impressed by its solemnity. Here in this inanimate case lay, in one sense, the springs of human action. For man has his engagements—his hours of business, mischief, duty or what not, and each of these would, at some future time, be checked off by the machinery now dumb and inert before us. The Turk might learn the value of time and lounge less upon his couch. The volatile Frenchman might spare a portion of his leisure for more important duties than those of pleasure-seeking; and wide over the fertile or sterile earth, on plains beautiful with verdure, or in some rocky fastnesses grim with cold and dark with decay and neglect, even in some "donjon keep," or in the palace of royalty, these little monitors might tick—tick—tick—"the day is passing away!" We saw the child of tender years, and senile old age, glance with its flushed and eager face or with a saddened and weakened vision at the white-faced clock that ticked remorselessly upon the mantel. We saw the young and old---a long stream winding up to the church, the bride with her groom, and the dead burying the dead. We saw the whole round of business routine in one unending throng run over the dial plate; them that do traffic and trade, and the money changers in the temple; and those also who rob that they may live, and steal while honest men sleep. Even the burglar, startled from his nefarious work by the shrill alarm of the clock, paused in his midnight raid and sneaked away. Nor were the processes of nature absent from the imagination; for time governs all things, even the growing of trees, the grass sprouting green in the sunshine and the flowers tinted by the pencil of the sun. The periods of all these things are recorded by some of the clocks made here; the minute, the hour, the day of the week, of the month, the month of the year and the year of our Lord. What more could any one ask?—and what fuller or more complete reminder of life and its manifold duties could we have than that afforded by the Yankee clock, ticking so surely and certainly upon the mantel, the whole year round?

"THE BRAZEN YOUNG LADY."

We should not omit, however, to notice another item of manufacture in the Waterbury Clock Company's room, namely, the "brazen young lady." Most of our readers in large cities must have seen the *autoperipatetikos* (we should like to know how much the proprietors of the patent paid for that name) or walking doll, who owes her (or its) existence, first, to the ingenuity of the inventor, and secondly to the SCIENTIFIC AMERICAN, who stood godfather to the doll and sent it forth upon its travels stamped and guaranteed from infringement or loss of dignity by trespass on her rights, and last but by no means least, to the Waterbury Clock Company. This young lady—clad in the full glory of shining raiment, and endowed with mysterious wheels, springs and shafts, instead of vitality—laid, at the time of our visit, about the workshop in various stages of construction. The huge boots she (or it) wears were made at one blow by a drop-press and afterwards fastened together; the wheels were cut out, and the whole mystery and miracle of her mechanical interior was exposed to view. A fearful buzzing and whizzing was heard as the works ran down or were wound up, and when, at the turning of the key the wheels were put in motion, the young lady tottled off upon the table in the full possession of all her powers.

Let us leave the factory and turn to another spectacle—to another branch of trade, some of whose wares aim not to preserve life but to destroy it. We will go over some of the rooms in the large factory occupied by the—

AMERICAN CAP AND FLASK COMPANY.

While the clock hints to mankind that time flies, the percussion cap performs a similar office in a different way. It does not hint alone, it asserts that not only time is fleeting, but that life itself is in danger; but the warning of the percussion cap is never heard until it is swallowed up in the fiercer explosion that insures certain death to those in the path of the missile projected through its instrumentality. The process of manufacturing percussion caps is very much more interesting and far more profitable than that of exploding them. And it may not be out of place to state that over 100 tuns of copper are annually made up here into this article alone; the Cap and Flask Company being the largest manufacturers in the country. They are also made out of the strip of copper that seems ubiquitous in Waterbury. In after ages, should that thriving place ever fall into ruin, we predict that strips of brass and copper will be seen sticking out in all directions. After the metallic tape has been rolled to the requisite thinness it is submitted to the action of a rapidly-working process, which cuts out star-shaped blanks in great numbers; these fall into a receptacle below, and are carefully collected and carried away to be formed up into the conventional cap shape. The cap is drawn up in the same general way that we have seen the kerosene-lamp tubes, &c., produced. The caps have now to be filled with a fulminating powder, counted and packed. The fulminating powder is prepared in an out-house, and is reduced from mercury in glass retorts and much care is necessary in its preparation. The caps are filled with this percussion powder by small plungers working in a machine devoted to the purpose. It seems like a very delicate operation to perform by machinery, but we were assured by the agent that no accident had occurred. The arrangement for counting the caps is very peculiar. A little girl holds a perforated tin plate in her hand which she thrusts into the heap of caps before her. The holes in the plate are just large enough to admit a single cap, and a slight sifting motion causes the apertures to be filled. There are one hundred holes in a plate, consequently when the plate is full the exact number is known; there is also a false bottom to the counter, which, on being pulled out, allows the caps to fall into a long trough, from which they are easily slid into the paper boxes. These boxes are all made on the premises, and employ quite an army of young women in their production. The labels are also printed on the premises. In this connection the story of the rebel soldier on the Rappahannock is not out of place. At one time our men were so near a certain rifle pit that they heard a rebel soldier snap his musket ineffectually several times; one of our men called out to him—"I say, Reb! where did you get your caps?" "They're Northern copperheads" was the quick-witted response. This anecdote has no significance, literal or political, but serves to show that in the art of making percussion caps the rebels have something to learn yet.

In another department belonging to this company we witnessed the operation of making powder flasks and shot pouches. The flasks are made out of tin, copper and zinc; three different kinds. The copper ones being of course the most costly. The designs on the side are struck by dies, and the halves—the flask is made in two pieces—are afterwards soldered inside by means of a tool peculiarly bent for the purpose. Shot pouches are made of embossed leather, and are sewed together on the outside in a handsome manner; yet another very effectual weapon was shown us in the shape of a pocket pistol. The pistol is a very harmless-looking concern and holds from a half of a pint to a quart of ammunition at one charge. It is carried in the inside pocket and is altogether a very handsome and convenient *tool*. Some medicinal virtues are also ascribed to it, as well as diplomatic ones, as it is asserted that in case of cholera or sudden and alarming cold in the head or violent pain in the epigastrium, the ammunition contained in the pocket pistol will effect a speedy cure. It is equally efficacious as a flag of truce, and has been known to heal differences of opinion very quickly, and dissipates any hostile intention entertained by an adversary.

© 1863 SCIENTIFIC AMERICAN, INC.

There are upwards of eight hundred different articles made in this building by the company, and we have only touched upon a few of them. We witnessed the operation of making metallic cartridge cases, measuring tapes, dram flasks and a great many others not to be here enumerated. We were much interested in all the processes above-described, and regretted that our time precluded further research. We had, however, an opportunity, while in Waterbury, to witness the operation of making—

BRASS KETTLES.

The universal "blank" is in demand, here as elsewhere, and is an enormous brass disk proportioned to the size of the kettle it is desired to make. This blank is put into an ordinary engine-lathe running at a high speed. The face-plate of the lathe has a cast-iron cone or *fac-simile* of a kettle secured to it, and the blank having been previously partially formed up in a shape somewhat like the finished kettle is now rapidly rotated. There is a small steel roller placed in close contiguity, which runs along the surface of the blank and draws it up or spins it out to the shape of the cone; thus the kettle is formed, and it only remains to turn up the bottom and wire the top and bale it to complete the article. The process of making kettles is very rapid or they could not be sold at almost the price of the raw material.

We would call attention to the very handsome exterior, as also the thoroughness and fidelity of construction, which characterizes all the articles abovementioned. At one time foreign workshops controlled the market in these wares; and we have reason to be proud that our manufacturers are taking the field successfully against competition abroad. That they may continue to improve and develop the interests of the country yet further is our most earnest desire. In our hasty walk through the factories noticed in this series of articles, we were much gratified to observe the almost universal substitution of machinery for manual labor; and, as we have previously remarked, such a course cannot fail to be of advantage to all concerned. Indeed it is imperative; and it is only through the instrumentality of instruments—to speak alliteratively—that the public are enabled to purchase the different articles so cheaply. What should we do for kerosene lamps or for thimbles, hinges and buttons, if we were dependent for them on tools only comparatively ingenious? The cost of those wares would be enhanced ten-fold. The progress of any manufacturing business that employs mechanical assistants, instead of depending on the various degrees of intellectual strength among workmen, is certain to be advantageous to all parties and cannot fail in its benefits to the world at large. The distinctive character of these articles on the manufacturing interests of the country will be retained in future numbers of the SCIENTIFIC AMERICAN, but our observations will be transferred to other localities.

DISCOVERIES AND INVENTIONS ABROAD.

Improved Drawing Rollers.—At a late meeting of the Institution of Mechanical Engineers, held in Birmingham, England, a paper was read by W. Weild, giving a description of an improvement in drawing rollers for spinning which he had lately invented and introduced. By the present method of spinning cotton the sliver is passed through a succession of fluted rolls, each pair of which runs at a higher speed than the preceding pair. The cotton fibers of the sliver are thus gradually drawn out and laid side by side in continuous juxtaposition ready for being spun into yarn or thread. The lower roller of a pair is the one that is driven, and it alone is grooved, the upper one being covered with leather and possessing a smooth surface. Being held upon the lower fluted metal the leather of the upper one gradually becomes indented by the flutes of the lower one, and when this takes place the fibers of the sliver are stretched irregularly and the thread becomes unequal in thickness. The success of making smooth even cotton yarn depends upon the uniform thickness of the drawn sliver. To obviate indentations being made in the leather rollers M. Weld forms his grooved rollers with spiral instead of straight parallel grooves, and by this arrangement the leather roller bears upon a number of flutes instead of only one. He also forms the flutes of the rollers with milled edges, and the material which he uses for them is Bessemer steel. Such rollers are also made made of less diameter than those in common use, and by this construction of them he asserts that he can make superior yarn and thread with a much shorter staple of cotton.

New Cement.—A patent has been taken out by J. Duke and J. Clever, of Puriton, England, for manufacturing a hydraulic cement from very common materials. They take slaked lime and clay in equal parts, then combine them together by agitation with water in tanks and allow the mixture to settle, after which they run off the water, dry the precipitate and then burn it in a kiln. When ground it forms a good hydraulic cement.

Silk from the Mulberry Tree.—P. Potenza, of Naples, has patented a process whereby he obtains a silky fiber from the bark of the mulberry tree. The bark is first carefully separated from the wood, then dried in the open air. After this the bark is boiled in a solution of soap when its interior layers are easily separated into masses of fine fibers, and may be carded and spun into threads with common machinery used for manufacturing cotton.

Plate for Artificial Teeth.—M. Cartwright, of London, has patented plates for artificial teeth, composed of gold and dissolved india-rubber intimately mixed together. The india-rubber is first dissolved in benzine, then leaf gold is ground with it in this state until an intimate plastic mixture is formed. This compound is then heated to render it soft and capable of being worked into the model of the plate to be produced, after which it is vulcanized by heat in a suitable oven.

Mounting Artificial Teeth.—Another invention connected with dentistry has also been patented by J. Thom, of London, and is described in substance as follows:—A model of the mouth to which the teeth are to be fitted having been taken in wax (or other plastic material), and the artificial teeth placed in their proper positions, a cast is taken therefrom in plaster-of-paris in the usual manner. After the mold has been completed and become hard, the wax is removed, and its place supplied with the india-rubber and sulphur, which is heated to a temperature of about 330° Fah., when the india-rubber becomes semi-fluid and takes the form of the mold; at the same time it becomes vulcanized and hardened. In cooling, the vulcanized india-rubber is found to shrink or become distorted from the original pattern, and therefore does not accurately fit the mouth from which the model was taken. In order to remedy this defect, and give the required accuracy to the artificial gum, the patentee submits it to the following additional and corrective process, which he claims as constituting his invention:—Having trimmed the vulcanized india-rubber and made any necessary corrections thereto, he replaces it (the teeth being imbedded in their proper positions) in the plaster mold, within a metal collar of conical shape, which by means of a screw-press brings the parts of the plaster mold in close contact with each other and with the vulcanized india-rubber. While subjected to this pressure, he heats it to about 220° Fah., which so far softens the vulcanized india-rubber as to cause it to conform itself strictly to the mold. In this state it is left to cool and harden; and being taken out, it retains the form of the mold and accurately fits the mouth from which the original model was taken.

Strawberries.

The following very sensible remarks upon choosing strawberries are from the *American Agriculturist*:—

"This is the harvest month for strawberries, and the time when the fruit is in perfection is the proper time in which to plan for new beds. While to many one strawberry is as good as another, those of larger experience know that this fruit presents a great variety, not only in flavor and relative sweetness, but in the size and hardiness of the fruit and the vigor and prolificness of the vines. The best berry for the table is not always the best one for the market firmness of flesh and abundant bearing are for this purpose the most important qualities. Though we may have many very fine varieties, perfection is not yet attained, and every year there are new claimants to superiority over old varieties. It is no doubt possible that the efforts of cultivators will yet produce a fruit which will combine all the excellence of the best-known varieties. Now is the time for those who intend to plant in the coming autumn or spring to visit the grounds of cultivators or fruit exhibitions and make observations for themselves."

VALUABLE RECEIPTS.

CURING BUTTER.—Melt the fresh butter in a glazed stone-ware vessel, and heat it to 180° Fah. The stone-ware vessel should be placed in a metal vessel containing the warm water. The butter is maintained at this temperature as long as any froth comes to the surface, and it must be skimmed until it becomes quite clear. It is then strained through a coarse flannel cloth, which will separate any of the cheesy particles that may remain in it. It is then poured into a clean stone-ware vessel and cooled as quickly as possible, by surrounding it with cold water or ice. This is the method employed by the Tartars for preserving butter. They supply the market of Constantinople with it, and it is stated that it will remain perfectly fresh in a cool situation for six months. Butter so treated, and then salted will preserve its fine taste for two years when kept in a cool situation. The chief cause of butter becoming rancid is due to the cheesy particles left in it in curing. These may be all removed by melting the butter, but care must be exercised so as not to raise the temperature above 180° or the flavor of the butter will be injured.

RANCID BUTTER.—The rancid taste and odor may be removed from inferior butter by melting it in a water bath with some finely powdered fresh charcoal, then straining it through flannel. The curdy particles sink to the bottom of the vessel in which it is melted. This operation, however, will not restore the primitive flavor to butter. We have seen melted rancid butter treated with a small quantity of the carbonate of potash. The odor and rancid taste were thus removed.

PRESERVING CASKS.—There is much truth in the old saying, "Economy is wealth." It may be safely applied upon a very extensive scale in the care of casks, for assuredly it seems to be a general rule that they do not receive much care, as they are too much exposed, in almost all establishments where they are much used, to the weather. They should be kept in a dry situation, or in one that is uniformly moist, as the continual variation from the one to the other soon rots them. As soon as casks are emptied they should be bunged down air-tight with as much care as if they were full. When a hoop becomes loose, it should immediately be driven up tight; and if it is broken a new one should at once be put on. Iron hoops are made of very soft iron, which is very susceptible of rust. When the hoops of casks become slightly rusty, they should be coated with boiled linseed oil, and allowed to dry before they are used. The oil will prevent further oxidation, and the hoops will last five times longer.

CLEANING MUSTY CASKS.—Several methods are successfully employed to purify casks. The most effective is by desiccation with a current of hot air driven in by a blower, but there are few situations where this system can be applied. Another method consists in rinsing the cask with dilute sulphuric acid. About ten pounds of vitric oil mixed up with cold water, will serve to clean fifty hogsheads. They must be rinsed with water after being agitated with the dilute sulphuric acid. Musty casks are also purified by smoking them with a fire of wood shavings kindled inside. Fresh slaked lime, mixed with water is also used for rinsing casks, to remove the musty odor. In all cases they should afterwards be thoroughly rinsed with hot water. High pressure steam, where it can be conveniently applied, is perhaps superior to any other agent for purifying musty casks. A correspondent of the *California Farmer*, in alluding to the method of purifying wine casks, says (respecting steam):—"To steam a cask, I open the bung and faucet-holes, and conduct through an india-rubber hose the steam, from a boiler to the bung-hole of the cask. The steam escapes with violence through the open faucet-hole. Twenty minutes cleans the cask completely, after which I rinse it out with water twice, then use. This is the sovereign of all remedies, and ought always to be made use of whenever it is possible."

© 1863 SCIENTIFIC AMERICAN, INC.

Correspondence

Defects of American Flax.

Messrs. Editors :—On page 249, current volume of the Scientific American, in an article upon the "Defects of American Flax," you may have done unintentional injustice to Western flax-growers, by copying from the transactions of the "Rhode Island Society for the Encouragement of Domestic Industry,' the following constructive imputation :—"A noticeable fact relative to all samples of Western flax exhibited to the committee is the weakness of the staple; that it wastes largely by manipulation, and, when prepared, appears only suited for coarse fabrics. On the contrary, Canada flax is very strong, wastes much less in handling, and when properly prepared seems fitted for the finest purposes. The inferiority in Western flax appears to arise from the different modes of cultivation and after-care. They believe that any failure to work Western flax will be traceable to a want of knowledge on the part of the producer of the best modes of sowing, reaping and curing it, rather than to any other cause; and that experiments to ascertain the best modes for the cultivation and care of it, with a view to its textile use, to be thorough, should begin with the planting of the seed."

You comment, very justly, upon the weakness, coarseness, and liability to waste, of American flax, but reiterate, not so justly, that these effects "are not due to climate or soil, but to a want of knowledge or carelessness in its modes of cultivation and after-care." It is true that our flax is inferior; it is a fact that farmers are not generally well posted in flax culture, because very few of them give any attention to it; it is also very true that many American farmers who grow very coarse flax are perfectly competent to grow a finer and better article. The Western flax is particularly coarse, but not from the ignorance or carelessness of Western flax-growers. Then where is the difficulty? Not with the farmers, who stand ready to produce as fine a specimen of flax as can be grown in thissoil and climate, and possibly equal to that of the Dutch and the Russians. The fault, if fault it is, lies at the door of the manufacturers. They have been slow to perfect processes and machinery for the manufacture of the fiber, for which there has been little or no demand, except for the coarsest uses, and for such purposes only to the most limited extent. For proof, note the fact that only 7,709,676 lbs. of fiber were produced in 1849, and that in 1859 that quantity was reduced to 3,783,079, or little more than one per cent. of the amount of cotton consumed by American manufacturers—a quantity not quite sufficient, were it cotton instead of flax, to run the Amoskeag (N. H.) Company's mills for six months.

A word as to Western flax in particular. Ohio, according to the last census, produced 250,768 bushels of flax seed in 1859, nearly half of the entire crop, but not a pound of fiber. Flax is grown for seed alone. Oil-mill manufacturers contract for the crop, furnishing seed for sowing, and stipulating usually that the maximum sown per acre shall not exceed two or three pecks. They thus obtain the largest quantity of seed for a given quantity distributed. The result is a coarse, stocky, branching growth, rendering the fiber nearly useless, which the farmer either burns or tries to reduce to manure. If near a paper-mill, he disposes of some of it for coarse paper. The grower may be an expert in flax-growing, and in the preparation of the lint, but he has no inducement to use his knowledge. This seed, planted year after year, perpetuates and increases the coarseness of fiber. You have hinted the cause of this deterioration, in saying that flax had hitherto been cultivated mainly for its seed; and your suggestions that the best foreign seed should be sought, as an auxiliary to improved culture, are very proper and quite timely. It was only the imputation of ignorance of cultivation and care, as a cause for inferior quality—manifestly due to manufacturing rather than agricultural considerations—to which objection is taken, which none would be more ready to remove than yourselves, or less inclined to cast upon the profession of agriculture.

J. R. Dodge.

Washington, D. C., June 11, 1863.

[It is quite true as stated by our correspondent that our farmers have never had much encouragement to cultivate fine flax. At present most of our cotton factories, in which the finer qualities of cloth have been made, are standing idle on account of the high price of cotton. We could wish they were all engaged in the manufacture of fine linen, which is a far more beautiful fabric than cotton cloth. Efforts should not be relaxed to introduce the linen manufacture extensively. We are positive that this business would be profitable if conducted with the skill and ability shown by the linen manufacturers of Ulster, in Ireland.—Eds.

Homan's "Excelsior" Horse Hay Rake.

Messrs. Editors :—No. 22 of the current volume of the Scientific American came duly to hand, containing (on page 344) a spirited and finely-executed illustration of "Homan's Patent Horse Hay Rake," which confirmed the belief I had entertained that you get up the best and most life-like engravings of machinery to be had in this country. The description, however, was defective, and contained some errors. The rake-head also serves as the axle of the machine, passing through the wheels, but being loose in the hubs and free to revolve in them independently of their motion, by the lever, D. The weight of the driver comes on the cylindrical portions of the hubs, and leaves the axle or rake-head free from any weight or pressure. The teeth are fastened to the axle, but are longer and have a larger curve than in the "cut," so that they will rake as large a windrow as desired. The use of the pins on the side of the seat is to regulate the position of the teeth, whether they shall press down hard or lightly, or skim the surface of the ground, as for a gleaner. This is done by resting the lever against the proper pin, thus reducing the labor of the driver to merely connecting or disconnecting the lever from the pins, with a very slight forward push at windrows. It is thus the easiest rake to operate yet invented, and adapted to the greatest variety of work and circumstances.

Now, I must also good naturedly claim to say a few words in favor of Mr. Homan's machine, lest some person may think, from a glance at the engraving, &c., that the rake is of the "dashing" order of things, and not a right-down practical working affair, as it really is. It is the result of a perfect knowledge of what was wanted, and suggestions by practical farmers; and, having been thoroughly tried in every way for three seasons, I believe it meets all the requirements of a reliable practical hay rake, as well as it can be done. It has taken the highest premiums at State and county fairs in the New England States, in nearly every instance where it has been entered for competition; it has received numerous commendations of the press and testimonials from well-known farmers, manufacturers and dealers in agricultural implements, and it soon becomes the standard rake wherever it is known. Several thousands are now in use, and I would refer to any disinterested person who has ever used one of them as to its value It was patented on Oct. 2, 1860, by S. J. Homan, of Orange county, N. Y.

For the benefit of patentees and others who have inventions, I would bear witness to the inestimable value of an engraving in the columns of the Scientific American. In the few days which have elapsed since Mr. Homan's rake was published, he and I have received nearly *thirty* letters of inquiry, besides personal calls, and the cry is "still they come." One engraving is worth many times the amount spent in ordinary advertising. I speak from experience, and consider that it is the very best investment that an inventor can make. All of the New England States and part of New York are disposed of, and an offer for the remaining territory has been made; but it will continue to be "retailed" for a while, at least. If this is not satisfactory evidence of its popularity, I should like to know what can be.

C. B. Holmes.

Dowagiac, Mich., June 2, 1863.

[We have afforded space for the insertion of the above communication from Mr. Holmes, out of courtesy to him, but he will see that our description was correct and embodied his own ideas in a much clearer manner.—Eds.

A Churn-power wanted.

Messrs. Editors :—On page 342, current volume of the Scientific American, you published a letter received from one "John Smith," setting forth the wonderful efficacy of "Drake's Patent Churn power," but the substance of that communication is so inconsistent that I take occasion to expose it.

"John Smith" says that "the machine can be wound up in two or three minutes by a child, and will give from fifteen hundred to two thousand strokes" (meaning revolutions), &c. I have done a good deal of churning in my life-time, and I know that the labor is often very severe, requiring the full strength of a man; and, just before the completion of the process, a man is only able to work from one to two minutes at a time, and can only make about one hundred revolutions at the crank, per minute, at that. Now, when "John Smith" asserts that a machine, which can be wound up by a child, will give out any such "power" as that above stated, it shows that "John Smith" is either peculiarly interested in said "power," or is a "perpetual-motionist," or has been sublimely humbugged by the vender of that "power," and now stands in—to say the least—a very ridiculous position.

A machine designed for the purpose of churning must be able to generate its own "power," or at least must not have the "power" put in to it by the human muscles, for, if so, there will be a loss instead of gain. No machine can give out the same "power" to its movements as would be required to wind it up. A small, cheap steam engine (perhaps a rotary one), just the "essence of simplicity," is probably about as near the thing desired as the present state of the arts will allow any inventor to produce.

F. N. Blackman.

Tomah, Wis., June 11, 1863.

A Carnivorous Bull-frog.

Messrs. Editors:—As your paper is devoted to the cause of science, or in other words, the development of truth by experiment and fact, I will send you an account of the result of an investigation of the contents of a bull-frog's stomach, hoping that some of your readers will account for the apparent phenomenon. Man is not the only animal that seems to be omnivorous. If he can equal he cannot certainly exceed the bull-frog in this respect. This reptile derives his title of "bull" from the resemblance of his deep guttural tones to those of the bovine animal of that name. I suppose when the frog has achieved all the necessary duties of contributing to the wants of his "inner man," or when he feels in good humor, or when he invites his "lady love," of the creek or the pond, to pay attention to his sonorous ditties, he emits his bull-like sounds of music. But to the point. Recently I accompanied a fishing party to Dardan Creek, some five or six miles from St. Charles, in St. Charles County, Mo., an excellent place for the skill of the fisherman. I caught some bull-frogs, and being of an inquiring turn of mind, I dissected one "quadruped." I found in his bullship's capacious stomach, two young water-snakes, one full grown bird, feathers and all, yet undecomposed, a cray-fish, with sundry other articles too numerous to be mentioned. The frog was fat; frog's hind quarters are generally considered a very delicate and nice piece of flesh, equal, if not superior to that of a chicken. Can you furnish any parallel to this case?

M. Coneannon.

St. Charles, Mo., May 29, 1863.

[We cannot see the exact analogy between the "cause of science" and a bull-frog's partiality for animal food; might it not have been a depraved instinct of the reptile? Is our correspondent certain that the bull-frogs of Missouri (*rana ocellata*) are generally carnivorous?—Eds.

To all whom it may concern.

Messrs. Munn & Co.:—I regret to inform you that in accordance with the provisions of an Act of Assembly of Nova Scotia, passed April 12, 1862, the right to take out Letters Patent in that province is confined to persons who shall have resided therein for one year previous to the date of their applications for such patents.

Peter Stubs.

St. John's, N. B., May 29, 1863.

© 1863 SCIENTIFIC AMERICAN, INC.

NOTES ON THE NATURAL PHENOMENA OF FLORIDA.

In the last number of the *American Journal of Science and Arts* there is an interesting article on the natural phenomena of Key West, Florida, by Major E. B. Hunt, Corps of Engineers, U. S. A. We condense some of his notes for our columns :—

Zodiacal Light.—In the month of February the zodiacal light is very distinct at Key West, and it is so clear that a shadow is cast by it. It is singularly beautiful to see this mass of mellow light fading out softly into the clear sky, obscuring the luster of the "Milky Way" by its superior brightness. Sometimes its radiance seemed to be a prolongation of twilight.

Atmospheric Transparency.—At Key West the sky is indeed beautiful. The stars shine out with a clear luster and fullness almost exceeding the display on the coldest and clearest night of a northern winter. It seems singular that a climate so moistened by the Gulf Stream may be seen the starriest of nights. This is due to the prevalent tranquillity of the atmosphere and a nearly unvarying temperature. At Boston Major Hunt has known the thermometer to pass through a greater range in one day than it does in a whole year at Key West, and the winds are generally gentle and steady in direction. He has only known of fogs occurring twice in that place ; the requisites for developing visible vapor are rarely prevalent. The temperature seldom rises above 90° Fah., and never, even after the severest northern winds, does it fall below 45°. The equability of atmospheric conditions affords an explanation for the beauty of the sky and the starry splendor, so attractive amid the soft and balmy airs of the locality. And were it not for musquitoes and yellow fever, the enthusiastic astronomer might there find his Eden in summer equally as well as in winter.

Gulf Stream Cloud Bank.—One of the local phenomena of Key West is the formation, shortly after sunset, of a grand bank of clouds above the Gulf Stream, rising from two to five hundred feet in hight. It stretches from east to west in massive irregular fleeces, dark below and silver-tinged above under the rays of the setting sun. The regular Gulf Stream is twelve miles south of Key West. Rapid evaporation of the warm sea-waters takes place during the day, and when the declining sun acts with decreasing force, the atmospheric temperature falls until, as the sunset approaches, the moisture-laden atmosphere above the Gulf Stream cools to the clear dew point, and the previously invisible vapor becomes cloud masses.

"Northers."—In the winter this warm moist climate is occasionally relieved by dry, cool northern currents of air. The approach of the "norther" is indicated by a low dark line above the horizon in the N. N. W. It comes down rapidly, usually accompanied with a slight dash of rain ; sweeping clouds of dust before it, and removing languor and exhaustion from the inhabitants, cooling the atmosphere and infusing energy and elevated spirits into all. It lasts for about three days and then shades out into a delicious mild N. E. breeze. The "norther" generally brings out a crop of efflorescent crystals on the brick walls of Fort Taylor, making it seem grey with age. The winter "norther" has its opposite in the summer hurricane. Such gales, Major Hunt states, conform to Redfield's theory of revolving storms.

Ventilation.—Owing to the peculiar warm, soft atmosphere, free ventilation and shade are the chief essentials of comfort at Key West. Great difficulty is experienced in preserving from decay all kinds of perishable articles of food. Major Hunt believes that the best way to preserve them is to seal them up in close, shaded chambers in which the air is kept dry. He made an experiment with flour in a close room, opening at the top into the Fort Taylor bakery, the air of which was kept artificially dry. Flour could thus be kept twice as long as when stored in the usual way in a wooden building. He believes that the best way to keep powder magazines dry in such a climate is to exclude all interior ventilation. The magazine, when filled, should have all the moisture extracted from its atmosphere by an absorbent, such as chloride of calcium, and be sealed up. The effect of opening the ventilators in Fort Taylor magazines results in condensing moisture on the floor and other surfaces. The stores in the fort are now soon ruined by the existing practice of ventilation and exposure to a moist atmosphere. Closed inner chambers, artificially dried, with an exterior ventilation to keep down the temperature, would add greatly to the durability of perishable supplies and the dry storage of gunpowder.

Yellow Fever.—Buzzards.—On two separate occasions when there was yellow fever in the Marine Hospital at Key West, Major Hunt saw a flock of buzzards circling over and near the roof of the building, and thus they continued for hours, day after day. A common belief exists in the town that these creatures only hover over the hospital when there are cases of yellow fever in it. Major Hunt says : "I am almost persuaded that this is a fact, and can only interpret what I have myself seen as indicating that an odor is then thrown out on the air, which the keen scent of the scavenger bird detects from afar. . . . . The particles scented may indeed be the actual *fomites* so much talked of, and so little understood, in discussing the controverted questions of contagion and communication."

CHROMIUM IN THE ARTS.

Chromium is a metal which forms several oxides that are much used in the practical arts. Its two native combinations are the chromate of lead and the chromite of iron—a compound of the oxides of chromium and iron. Metallic chromium may be obtained by igniting its oxide intensely with about one-tenth of its weight of charcoal. Its color resembles that of platinum ; it scratches glass and takes a good polish. There are four oxides of chromium, namely : Protoxide, Cr O ; a sesquioxide, $Cr_2 O_3$; an intermediate oxide, Cr O, $Cr_2 O_3$, and chromic acid, Cr O_3. The sesquioxide of chromium ($Cr_2 O_3$) is obtained by heating chromate of mercury or chromate of ammonia to a dull redness ; and it is also formed by the action of a red heat upon bichromate of potassa. In this case neutral chromate of potassa is formed, which may be removed by washing the product. This oxide is of a green color, is not changed by heat and is much used in enamel and porcelain painting, also as a pigment for printing on paper. Chromic acid forms carmine-colored needle-shaped crystals, rapidly deliquescing in the air, and dissolving very easily in water, forming a dark reddish brown or lemon yellow solution. The concentrated acid corrodes paper like oil of vitriol, and, when in dilute solution, it likewise attacks paper and other kinds of organic matter, especially when aided by light or heat, becoming converted into the brown oxide or the green sesquioxide, according to the extent of the decomposition. The chromate of potash is manufactured by heating pulverized chrome iron-ore with carbonate of potassa and a little niter in a reverberatory furnace—stirring the mixture to absorb oxygen. The product thus obtained is digested in water, and the solution obtained is super-saturated with nitric acid, which precipitates silica and leaves the chromate in solution. The bichromate of potash is much used in the arts of dyeing and printing cotton and woolen fabrics ; also in photography. It is obtained by adding a sufficient quantity of sulphuric acid to a solution of the chromate until its taste becomes sour, then setting it aside for a few days, when deep orange crystals are formed, constituting the bichromate. The crystals are anhydrous prisms, and are soluble in hot water. Solutions of these chromates are very injurious to the skin, causing sores which are difficult to heal. Paper impregnated with a solution of the bichromate possesses photographic powers. It has remarkable coloring properties, as one part of it will impart a yellow color to 40,000 parts of water.

The great use of bichromate of potash in photographic operations is due to the ready way in which it parts with some of its oxygen to organic matter under the influence of light. Bichromate of potash may be looked upon as containing one part of chromic acid in the free state. Now chromic acid has a large quantity of oxygen locked up in it (three equivalents of oxygen to one equivalent of chromium) and it is somewhat of an unstable compound, having a tendency to give up oxygen and pass to a lower state of oxidation at the slightest opportunity. When placed in contact with an organic substance, such as paper, gelatine, leather, horn, parchment, the skin, &c., the oxygen of the chromic acid is ready to unite with the carbon and hydrogen in those bodies. The change goes on, however, very slowly in the dark, requiring the stimulating action of light to set it up, but under this influence it speedily passes to the state of brown oxide, Cr O_2, and then to the sesquioxide $Cr_2 O_3$.

This formation of brown chromate of oxide of chromium is the first result of the action of light upon a mixture of bichromate of potash and organic matter, and occasions the brown tint left behind in the paper. If the action of light is allowed to proceed further, the deoxidation ultimately proceeds to the greatest possible extent, and the chromic acid is entirely reduced to the state of sesquioxide of chromium. This has a green color, and its presence may often be observed in photographs printed in this manner. The reduced brown oxide of chromium reacts in several ways, like a combination of an acid and a base, and when washed with metallic and other solutions, give rise to other insoluble metallic compounds of various colors, by a process of double decomposition. Hence the numerous bichromate of potash printing processes in which variously-colored positives are produced. Upon gelatine, in its numerous forms of gelatine, isinglass, glue and the allied bodies, gum, &c., another action takes place at the same time. The reduction of chromic acid is effected in the same manner, but the oxygen which it loses attacks the gelatine and converts it into a slightly different chemical substance, rendering it partially or entirely insoluble in water.

The bichromate of potash is employed as a mordant to prepare woolen goods to be dyed black with logwood. The goods are simply boiled first in a weak solution of it, then in an extract of logwood. It is also employed as a mordant for brown colors on wool. With a preparation of the acetate or nitrate of lead, cotton cloth is dyed yellow by subsequent immersion in a solution of chrome ; and, if immersed afterwards in warm lime-water, it will change into orange. The chromate of lead is employed as a yellow paint, and is applicable to both oil and water colors. The sulphate of chromium combines with the sulphate of potassa, forming a beautiful double salt, which crystalizes in green and purple octahedra, and is called chrome alum. A small quantity of the metal chromium will unite with steel, forming an alloy suitable for the finest cutlery instruments.

Chrome ore is obtained in great abundance in hills near Baltimore, Md., where the manufacture of the bichromate of potash is carried on extensively.

Petroleum Exports.

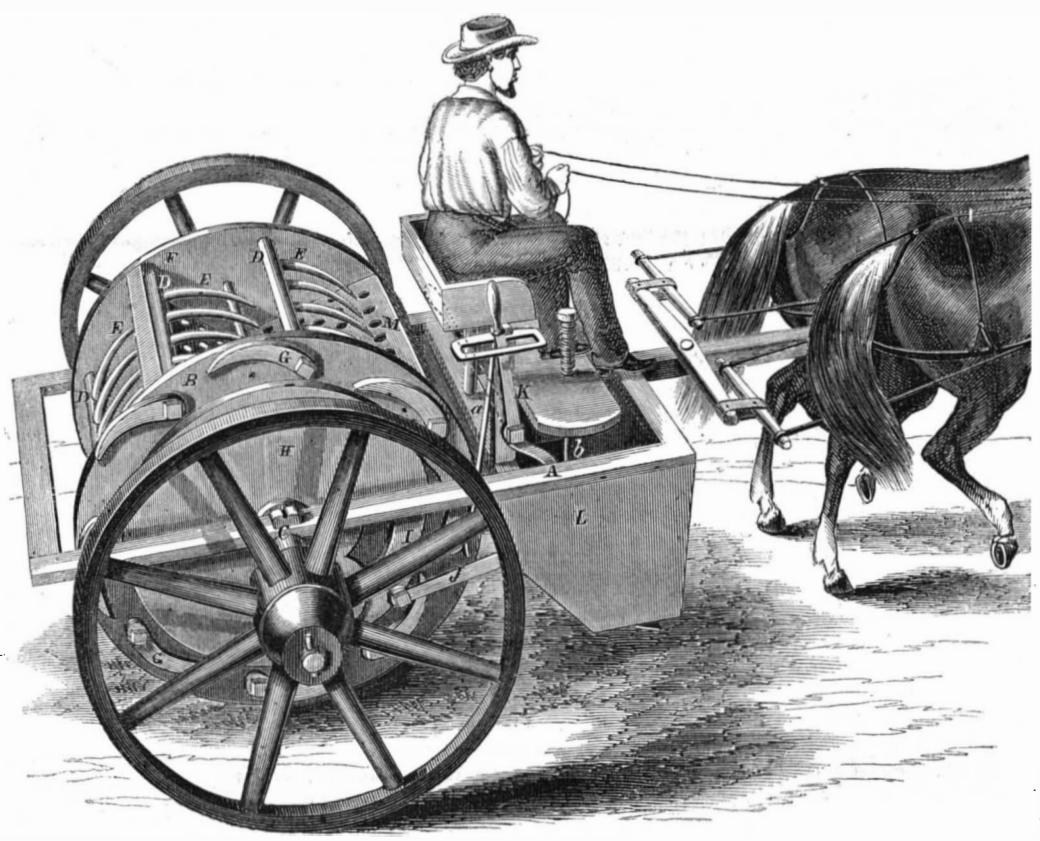
Since the first of January last, up to the 1st. inst., no less than 10,110,810 gallons of petroleum have been exported from New York to foreign ports, against 2,920,089, in 1862. In addition to the above, 5,180,762 were exported from Baltimore, Philadelphia, Boston and Portland, making a grand total of 15,291,572 gallons. Our petroleum trade is one of the wonders of modern commerce—fifteen and a quarter millions of gallons sent abroad in five months, and in all likelihood as great a quantity has been consumed at home! The growth of the foreign demand has been unprecedented in rapidity, as only one million of gallons were exported in 1861. At present the stock of petroleum in the oil region is much less than it was at this period last year, and the yield of the wells is said to be less. The amount is about 5,000 barrels—200,000 gallons—per day. At 25 cents per gallon for crude oil, the value of the above quantity, exported this year, amounts to $3,822,893.

Storing Butter under Ground.—A correspondent of the New York *Agriculturist*, writing from Pendleton county, Ky., says, respecting the preservation of the butter :—"Last June I commenced packing butter. I washed it well through two or three waters when it was first churned, and worked it over again before I packed it, putting it in large stone jars, and digging a hole under the floor of the smoke-house, having no cellar or other good cool place. The top of the jar was left just above the ground. I then put strong brine about two inches over the butter, pouring it off each time as I put in fresh butter, adding nothing but salt to the butter ; and, in January last, I sold 60 pounds of butter that was as sweet and good as when first packed."

© 1863 SCIENTIFIC AMERICAN, INC.

Improved Potato-digger.

One of the most laborious duties devolving upon the farmer is that of harvesting the crops he has sown in the early part of the year. Of these duties, gathering potatoes has certainly little to recommend it as a pleasant occupation. The continued tension of the muscles of the back and the unnatural position of the body, causes fatigue and a rush of blood to the head, and is often productive of pains in the back that last for a long time. Such disagreeable features it is desirable to avoid, and to this end we illustrate, this week, a machine for the purpose of digging potatoes, which ought to be generally adopted. It will, we think, accomplish the purpose very thoroughly and much quicker than by hand labor. The body of the machine, A, carries a drum, B, in the center, which revolves on the axle, C, of the wheels. This sifting drum is provided with a series of shafts, D, which, in turn, are fitted with the diggers or forks, E; these forks are firmly fastened in the shafts. On the ends of the shafts, which work freely in the side, F, of the drum, there are secured the toes, G. These toes work over the disk, H, made fast to the rotating drum before mentioned. There is also an adjustable cam seen at I; this cam works on the drum shaft and is connected by a link, J, with the hand lever, K. These constitute the principal features of the machine.



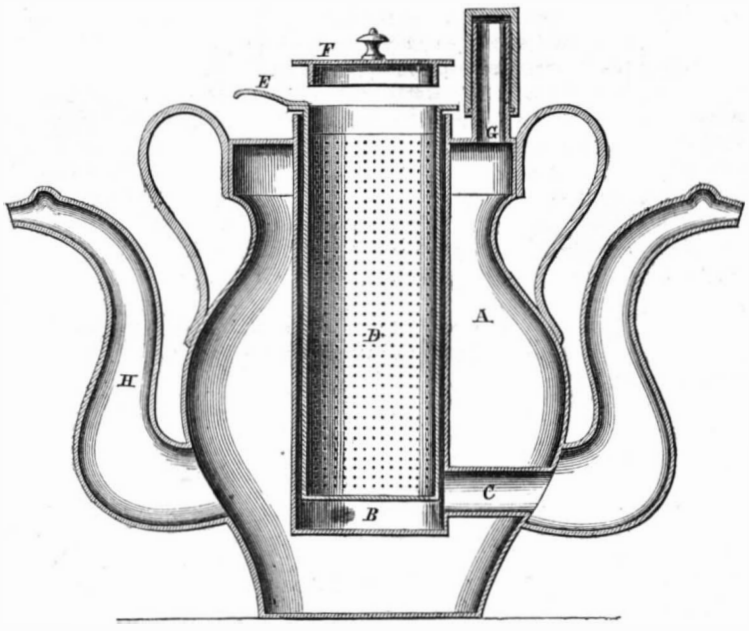
HOLCROFT & SMITH'S PATENT POTATO-DIGGER.

The operation of it is as follows:—When the machine is drawn over the surface of the ground, the forks do not enter when the hand lever is in the position shown by the dotted lines, as in that case the cam is drawn out so that it makes a complete circle with the disk, H, and the toes follow around without changing the position of the forks; should the cam be thrown back, however, the toes will then run over the disk until they come to the break seen in it; the small spring, *a*, seen bearing on the back of the toe, then forces it into contact with the cam, thus throwing the fork teeth out at an angle with the drum and nearly vertical to the ground, in just the proper position for digging. The team then advancing with the machine draws the forks through the hills of potatoes, and as they emerge on the further side loaded with soil and the vegetables, the whole contents fall into the partitions, M. The holes in these permit the dirt to fall out through the bottom of the machine, and the potatoes are, by the continued rotation of the drum, discharged into the box, L, in front, from whence they are easily removed as occasion demands. At the bottom of the box there may be seen a portion of a trap-door; this connects with the rod, *b*, in front of the driver; the spiral spring keeps the door closed and pressure upon the knob causes the bottom of the door to open, and releases the load into bags or any other desired receptacle. The number of forks can be augmented as desired, as also the partitions.

This seems to be a very excellent machine for the purpose and will, we think, so far as the arrangement of the mechanical parts are concerned, do the work intended for it. It was patented through the Scientific American Patent Agency on March 24, 1863, by Henry Holcroft and C. S. Smith, of Media, Pa. Further information can be obtained by addressing them as above.

Combined Hot Water and Tea Urn.

The apparatus herewith illustrated is one of those articles that are convenient in every family. By its use the tea is made very perfectly, and prevented from losing its flavor by evaporation. The invention consists of a kettle or urn with two spouts, and an internal chamber, A. The tea falls into the chamber, B, as it is distilled from the leaves placed in the perforated holder, D, and is poured out through the nozzle, C. The handle, E, is fitted to this holder, and the cover, F, prevents the steam of the tea from being dissipated. At G, may be seen an aperture for pouring in the hot water to the chamber, A. It will be seen that the water completely surrounds the tea chamber, and that there is a separate spout by which it can be decanted as required; the urn being conveniently hung on pivots for that purpose. The water is kept hot by a spirit lamp on the stand in which the urn sits. The manner of operating this apparatus and some remarks on the proper way to make tea are here appended, and they will be found useful, inasmuch as there are very many persons ignorant of this simple duty. It is desirable to obtain from the leaves the largest possible amount of virtue which can be extracted and retain it in the decoction thus made. The thein of tea is combined with tannic acid, and forms a compound which requires boiling water to dissolve it. But on the other hand, the aromatic oil of tea is so volatile that boiling tends to drive it off with the steam into the air. If warm water is used, thein, the most important element of tea, is not obtained. The plan to be pursued therefore, with this improved apparatus, is to fill or partly fill the pot or urn, A, with boiling water, remove the perforated tea-holder, D, put a sufficient quantity of boiling water in the chamber, B, replace the perforated tea-holder, D, containing a quantity of dry tea, and shut or close all the covers and lids to retain the virtues of the beverage. The water in the pot or urn, A, being kept at a high temperature by a lamp underneath or otherwise, prevents the decoction of tea from becoming turbid, and the tannate of thein, being held in solution, is prevented from cooling and forming a skin upon the surface. This is a very useful and convenient apparatus, and should become popular. A patent is now pending, through the Scientific American Patent Agency, for this apparatus, which is the invention of Alexander M. Bristol, of Detroit, Mich.; further information can be obtained by addressing the inventor at the above place.



BRISTOL'S PATENT TEA URN.

The Farmer's Creed.

A local contemporary gives the following:—"We believe in small farms and thorough cultivation. The soil loves to eat as well as its owners, and ought therefore to be nurtured. We believe in large crops, which leave the land better than they found it—making both the farm and farmer rich at once. We believe in going to the bottom of things, and therefore in deep plowing and enough of it—all the better if with a subsoil plow. We believe that the best fertilizer of any soil is the spirit of industry, enterprise and intelligence; without this, lime and gypsum, bones and green manure, marl or plaster, will be of little use. We believe in good fences, good barns, good farm-houses, good stock, and a good orchard. We believe in a clean kitchen, a neat wife in it, a clean cupboard, dairy and conscience. We firmly disbelieve in farmers that will not improve, in farms that grow poor every year, in starved cattle, in farmers' boys turning into clerks and merchants, in farmers' daughters unwilling to work, and in all farmers who are ashamed of their honorable vocation."

THE Manhattan steam engine, No. 8, went out on the *Great Eastern*, on the 6th inst., to take part in the grand trial of machines of that class, to be held in London sometime in July this year.

© 1863 SCIENTIFIC AMERICAN, INC.

The Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY
At No. 37 Park Row (Park Building), New York.

O. D. MUNN, S. H. WALES, A. E. BEACH.

TERMS—Three Dollars per annum—One Dollar in advance, for four months.
Single copies of the paper are on sale at the office of publication, and at all periodical stores in the United States and Canada.
Sampson Low, Son & Co., the American Booksellers, No. 47 Ludgate Hill, London, England, are the British Agents to receive subscriptions for the SCIENTIFIC AMERICAN.
☞ See Prospectus on last page. No traveling agents employed.

VOL. VIII, NO. 25...[NEW SERIES.]....*Nineteenth Year.*

NEW YORK, SATURDAY, JUNE 20, 1863.

THE TAX ON MANUFACTURERS.

We have received a circular upon the above subject, signed by a well-known manufacturing firm in Chicago, which sets forth certain grievances experienced by manufacturers under the amended tax law, coupled with a call for a general convention of all concerned, to be held in that city on the 4th inst. We regret not to have received the circular in time to have enabled us to discuss its merits previous to the sitting of the convention, but the subject is one of too general interest not to receive candid criticism. The circular sets forth that while manufacturers do not object to the payment of a fair proportion of such taxation as is necessary for the support of the Government, they are, as a class, singled out as objects for oppressive and unjust taxation; and it instances the tax of three per cent on manufactured articles, in addition to the ad-valorem duty previously imposed upon the raw material. The circular also insists that some honorable member of Congress who helped to pass the law is now of the opinion that it was pushed through without due consideration—the result of sharp practice or hasty legislation. It also sets forth the magnanimity of manufacturers in this, that while the tax of three per cent is imposed upon them, they have not added it to the selling price. Objection is also made in behalf of manufacturers to the exposure of their business by the returns which must necessarily be made under the law of the extent of their manufacturing business and the profits resulting therefrom; and the circular concludes by urging upon the Commissioner of Internal Revenue to either ignore the law altogether, or to suspend its operation until Congress can meet and repeal the obnoxious feature of the bill.

While we cannot coincide with the allegations contained in the document, we commend the calling of a convention to consider the subject, as it will afford some intelligent political economist an opportunity to show to those zealous manufacturers that their views of the law are not correctly formed, and that their opinion, that the Commissioner of Internal Revenue should either ignore the law or suspend its operation, will not bear the light of moral investigation We do not think any class in the community have been distinguished by those entrusted with the work of preparing the schedule of taxation, or that it is the result of hasty legislation on the subject; but that in view of the fact that manufacturers in general make large profits and find ready sales, they were both able and willing to pay the amounts at which they were rated. Certainly no one can object to that part of the circular which exclaims against bruiting to the corners of the streets, the state of the private business of any firm or individual; such a condition of things as this involves could not be tolerated. It would at once put an end to all business principle and usage; it would sap the very foundations of mutual good feeling, and subvert all established customs. The relations between the assessor and the assessed should be as strictly confidential and as much respected as those observed by physicians toward their patients or by an honorable attorney toward his clients.

We can assure our most timid manufacturers that they need not hesitate to give all necessary particulars about their business for fear of publicity, as the instructions to assessors state specifically that these statements "must not be exhibited to the inspection of any one." Government ought to be very careful about the appointment of inspectors; certainly none but the most honorable and high-minded men are fit to fill these offices of trust and confidence. We cannot tolerate, even for an instant, the proposition that the Commissioner should ignore the passage of the bill. Such a course would be entirely opposed to all moral principle and be productive of no end of evil. The laws are made to be observed, and are to be upheld until they are legally repealed; and individual interest must go to the wall, and not hinder their execution.

The tax on manufacturers is doubtless heavy, and will fall with great inconvenience on many; but we, as publishers, might as well claim exemption from the onerous burthen as the manufacturers. We pay a heavy tax on paper, the price of which has greatly increased since the war, also upon every other article used in our business. We also pay a tax of three per cent upon our advertisements, and the income tax on all over $600, allowed by law. Now if manufacturers have not charged the three-per-cent to their prices, we honor them for their magnanimity, but we really think few of them have failed to take good care of their interests in this respect. They are entitled to a living profit for their capital, skill and labor; and as a class we are happy to know that they are abundantly prosperous in spite of grievous taxation.

COMPOUND CYLINDER ENGINES.

This variety of the steam engine, now attracting so much attention in England, has received very little notice from our own engineers, and we can recall to mind but one instance at the present time, where the principles involved in it have been successfully adopted; that instance is the *Buck-eye State*, a steamer formerly running on Lake Erie, and, for aught we know to the contrary, still employed there. The engine of this steamer was built from drawings furnished by Erastus W. Smith, the well-known engineer of this city, and embraced the general features, in principle, of those English engines which we have alluded to at the head of our article. The cylinders of the *Buck-eye State's* engine were two in number, and were contained the one within the other; the internal cylinder was 32 inches in diameter, and had 11 feet stroke, the external one was 80 inches in diameter, with of course the same stroke. The internal cylinder was turned outwardly, and the large piston was of annular form, and fitted both cylinders steam tight. The boilers were of the flue-tubular type and carried a pressure of 75 pounds to the square inch above the atmosphere. The consort of this vessel was the steamer *May Flower* (since lost), a vessel every way similar to the *Buck-eye State*, except in the matter of the machinery. The *May Flower* was fitted with an ordinary working-beam engine of 70 inches diameter of cylinder, and 11 feet stroke, working steam at 30 pounds per square inch above the atmosphere. She performed the same service as the *Buck-eye State*, but not so economically. The company's books show a difference of 30 per cent. in favor of the compound cylinder engine, over the ordinary beam engine. This was the net result of one year's trial, and the *Buck-eye State* weathered all sorts of heavy gales, during which the engine was severely tried; we never heard that it failed to perform well. For some reasons that we could never ascertain, no other engine of this particular pattern was constructed, although, in view of the results, such a course would seem politic. Several other engines approaching in principle but differing widely in detail and the mode of operating the valves have been constructed in this country; but they have all been laid aside sooner or later, and the engine of the *Buck-eye State* is the only one built on the plan in question we can recall at present, which continued to do duty for a term of years. The English compound engines, designed to work steam expansively, are of peculiar construction and a certain amount of complexity in the connections and the steam passages seems unavoidable. The lesser cylinder is bolted to the back of the larger one, and the lesser piston rod is keyed to the greater piston, this latter has a trunk secured on it, in the bottom of which the connecting rod is jointed as usual. The smaller cylinder is surrounded with a steam jacket. If as good results as are claimed for this class of engine are obtainable, why are they not more generally employed?

COTTON GINS AND GINNING.

On page 26, Vol. VII (new series), of the SCIENTIFIC AMERICAN, we gave a description of our visit to the factory of the New York Cotton Gin Company in King street, near the Atlantic Docks, South Brooklyn. We described the operations of ginning Government Sea Island cotton by Brown's "Excelsior Roller Gin." Since that period those gins have been visited by an agent from Egypt, where the Sea Island cotton is now cultivated, and so well pleased was he with their operation that he contracted for twelve on the spot. These were soon completed and forwarded to their destination, and after being fully tested they gave such satisfaction that three different orders have since been received, embracing one hundred and ninety-two gins, the last twenty of which are now being completed. What wonderful changes have taken place among the nations during the lapse of centuries—young America now furnishing improved mechanism to that land which was the cradle of the arts and sciences!

Last week we again visited that cotton ginning establishment; having been informed that two of Brown's "Double Cylinder Gins" for short staple or upland cotton had been set in operation there, and that they were the first that had been employed north of Mason & Dixon's Line. These are saw gins, and entirely different from the roller gin for Sea Island cotton. The common cotton gin used for cleaning the short staple consists of a single long spindle on which are secured a series of thin circular saws; and in front of these is the feed-box with a "breast-fall," in which are secured a series of thin metal ribs, and behind the saws is a revolving brush. The saws revolve and play for a short distance between the spaces of the ribs, and thus they catch the fibers of the unclean cotton placed in the feed-box, and draw them through the spaces, which are too narrow to permit the seeds to pass through. In this manner the fibers are stripped from the seeds, and the latter fall down below the "breast-fall," while the clean cotton is carried behind the cylinder, removed from the saws by the revolving brush, and thrown back into the room behind. Instead of using one long saw cylinder, which requires a very extended space in front, two cylinders are employed on this improved gin, and thus the same number of saws are enclosed in one half of the horizontal space. The two saw cylinders are set above one another, at about one inch apart, and they revolve in the same direction, therefore the top of the lower one is always moving contrary to the bottom of the upper one. This arrangement prevents clogging of the cotton in the box, so that the fiber is not so liable to be cut as in the single roller gin. One of the gins in operation has fifty saws—twenty-five on each cylinder, and the other has twice that number. The small one has cleaned 2,400 lbs. of cotton in one day; the larger 5,000 lbs., and the separation of the seed and mots appears to be effected in a superior manner. The saws are nine inches in diameter each, and the small gin occupies but few feet in space, and can be attended easily by a boy. Mr. Israel F. Brown, of Columbus, Georgia, is the inventor of the double cylinder gin, and for more than a quarter of a century has been engaged in the manufacture of cotton-cleaning machinery. On account of our national troubles he was forced to come to the North; and Mr. Franklin H. Lummus, of No. 82 John street, this city, who is the general agent of the company, has introduced these machines, thus applied them, and a factory for their construction has been established at New London, Conn. A very great quantity of uncleaned cotton has arrived at New York during the past year, and the ginning of it here has been conducted upon an improved and extensive scale. We saw these two double cylinder gins operating upon upland cotton grown from Sea Island seed in Venezuela, and it was cleaned in a very superior manner.

A report had lately been made to the Bombay Government by Major Forbes, superintendent of the cotton gin factory in the Dharwar Collectorate, in which he complained of the foreign cotton gins—single

© 1863 SCIENTIFIC AMERICAN, INC.

cylinders—which had been tried in India, and he asserted that none of them equalled the native "churka." The cotton gins required for the East Indies are the small (hand) sort, and with the churka or native gin, one man can only clean 20 lbs. in twelve hours. It appears to us that this new double cylinder gin is well adapted for all kinds of short staple cotton; and from the advertisement of the company on another page, we learn that they manufacture hand as well as power gins. With a small double cylinder gin, one man will clean 200 lbs. of cotton in the same space of time that he will clean twenty pounds with a churka. We think that if the agents of the East India company were to witness these improved American gins in operation, they would meet with the same favor from them that the "Excelsior Sea Island Cotton Gin" received in Egypt. Small gins of this character are also well adapted for the use of those farmers who have begun to cultivate short staple cotton in Southern Illinois, Indiana, and Kansas.

THE ANNUAL EXHIBITION OF THE ACADEMY OF DESIGN.

The National Academy of Design opens this year with a full and fine display of pictures, and the names of those artists who have become celebrated at home and abroad are well represented by their works. McEntee, Casilear, Cropsey, Hart, Durand, Beard, Bierstadt, and many other famous artists contribute of their genius and people the long green room with patches out of the cool heart of the forest, with scenes by the way, with groups of still life, and all the busy or silent transactions of the world of nature and of art. There are doubtless technicalities to carp and sneer at, and flaws which might be picked and pointed out by those profound critics who *do* the columns on art in the daily papers; but as for us, though we lose forever the opportunity of passing judgment on an art we are not at all familiar with—though we pass over the learned stock-in-trade of gibberish about shadows, and middle ground, and fore ground, of depth, distance, treatment, gray skies, cool tones, and a multitude of other swash-buckler phrases employed by critics to conceal their ignorance—though we omit them, we did not enjoy any the less the real effect of the artists' skill. A great improvement is manifest in the character of the exhibition over that of former years; not indeed because the critics have been so profuse in their adjectives, but by reason of the inevitable refinement and cultivation which attends and hedges about a true artist. Though groping blindly at first, and seeing nature as through a glass darkly, yet he comes sooner or later to know her face to face, and the result of such communion is that nature, dwelling in the heart of the painter, sits upon his canvas and beams upon the eyes of the visitor at the gallery like a leaf out of the early memories of his youth. There are a myriad of summer days embalmed in that narrow green room, and there are cool green lanes that wind in and out; and groves of trees; so vivid and distinct do these stand out that one listens with uplifted ear, half expecting to hear the susurrus and murmur of the soughing pines, or the shivering of the maples that bend to the soft south wind. There are battle scenes too, wherein the terrors of the war are reproduced. A cavalry charge in Virginia, in which the brave young Lieut. Hidden lost his life; above the cut-and-thrust of the scene depicted so faithfully on the canvas, the hero of the fight, Lieut. Hidden, looks down from another frame, and one can scarcely believe that his slight form could have performed such a feat as it did, dispersing two companies of rebel infantry with a squad of fifteen men. Those who delight in spending a quiet hour would do well to avail themselves of the attractions of the gallery.

BURNING OF AN OIL TRAIN.—The Philadelphia *Ledger* states that recently a train of truck cars on the Pennsylvania road, laden with petroleum, was ignited by a spark from the locomotive, somewhere near Kittanning Point, Pa., on the mountains. In a few minutes four of the cars were in flames. The rest of the train was cut loose and saved. The heat of the fire was so intense and consuming that the cross-ties of the track on which the cars stood, and also the track adjoining, were burned through, and the rail so warped as to render it difficult for trains to pass. The axles of the cars were melted down until they almost touched the road bed, and the wheels were bent inward.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list:—

Press for forming Dies.—This invention consists in the arrangement of two hinged levers acting on a vertically sliding plunger, and acted upon by adjustable slides guided by grooves in the inner side of the frame of the press in combination with two arms projecting from the main or upper follower and acting on the adjustable slide, and with an adjustable press box in such a manner that the metal or alloy in the press box can be subjected simultaneously to a pressure from top and bottom, while, at the same time, the press box prevents the metal spreading, and consequently produces a clear and distinct impression or a die of the desired shape and size; it consists further in the employment of a press acting simultaneously from top and bottom for the purpose of forming dies by pressing the matrix or pattern on a red-hot body consisting of an alloy of tin and copper; it consists further in making the sides of the press box, removable and adjustable, so that the same can be set to suit dies of various sizes and shapes. Max H. Stein, of New York city, is the inventor of this improvement.

Fire-arm Primer.—This invention relates to primers the magazine of which, containing the percussion caps or pellets, is in the head of the hammer and the delivery of the caps or pellets from which is effected by a feeding slide actuated by the descent of the hammer. It consists, first, in a certain mode of applying the spring by which the feeding slide is drawn back as the hammer is raised, whereby the construction of the primer is simplified; and, second, in the application of a spring stop in connection with the lever which works the feeding slide, whereby the primer, while its magazine is full or partly full of caps or pellets, may be rendered inoperative, and the hammer be made to operate as an ordinary hammer upon caps applied to the nipple in the usual way, thereby enabling the caps or pellets in the magazine to be held in reserve. A. F. Tait, of Morrisania, N. Y., is the inventor of this primer.

Desiccating Apparatus.—The object of this invention is to effect the desiccation of fruits, vegetables, meats, fish and other substances at so low a temperature as not to impair their flavor or nutritious properties; and to this end it consists in the employment, in such desiccating process, of a pan or vessel of suitable depth to contain such substances, arranged within or over a vessel containing water and heated by the vapor rising from or through said water at a temperature not above the boiling point; the said water being heated by steam or by the direct application of fire to its containing vessel, and the latter vessel being open to the atmosphere. It also consists in the employment, in combination with such desiccating vessel, of rollers for crushing and spreading out, and rakes, scrapers or stirrers for stirring up the substances to be desiccated; such rollers, rakes, scrapers or stirrers being attached to and driven by a rotating shaft arranged in the center of the vessel. W. K. Lewis, No. 93 Broad street, Boston, Mass., is the inventor of this improvement.

Improvement in Pianofortes.—This invention consists in an improved construction of what is termed in pianofortes the full metallic plate, whereby the bringing any of the string bearings on any such plate is avoided; thus bringing the connections of the strings with the tuning pins on wooden bearings, and so close to the wrest plank as to prevent the leverage and great strain on the pins, which is unavoidable when the strings pass over the plate, as has commonly been the case when the plate has been used. By these means the only objection heretofore existing to the use of such plate is obviated, which is so advantageous in all other respects. David Decker, of the firm of Decker Brothers, No. 91 Bleecker street, New York city, is the inventor of this improvement.

Letter Envelope.—The object of this invention is to produce a letter sheet which can be conveniently folded up and sealed the same as an ordinary envelope, and which can be cut out with little waste of paper, and its whole surface, or nearly so, can be made available for writing. It consists, first, in extending the side flaps over the whole width of the sheet, and overlapping the same with or without gum, in such a manner that said side flaps, before folding, form an essential part of the letter sheet to be written upon the same as the central portion of the sheet, and that the contents of the letter when the same is folded, cannot be read by pressing the edges of the letter and peeping in sideways; second, in the arrangement of marks or notches at the ends of the side flaps and opposite to the head flap, in such a manner that, in folding over the side flaps, two points are provided to serve as guides in creasing, one point being the junction of the head and side flap, and the other the notch or mark opposite to that junction, and thereby the operation of folding the letter is rendered easy. William Murphy, of 438 Canal street, New York city, is the inventor of this improvement.

Device for moving Goods and Merchandise.—This invention consists in the employment of two endless chains having crossbars attached to them and fitted over rollers or pulleys which are secured to a plank or skid, the latter having guards attached to its sides and ways to either or both of its surfaces, all being so arranged that the freight or merchandise may be moved with the greatest facility for loading and unloading vessels, and for similar or analogous purposes. Robert Bragg, of San Francisco, Cal., is the inventor of this apparatus.

Railway Car for carrying Petroleum.—This invention consists in the construction of the body of a railway car of corrugated or other sheet iron in the form of a cylinder, whereby it is made of the greatest strength with the least practicable weight of material, and is rendered especially applicable to the transportation of petroleum and other liquid substances; it also consists in the combination with such car body, of a system of pipes running under the whole or any portion of the length of the bottom of the car, near the sides thereof, and furnished with a series of cocks and flexible branch pipes for drawing off the liquid contents of the car into several barrels or other vessels at once. And it further consists in the protection of the said cocks by means of boxes so constructed and arranged as to allow the flexible branches to be stowed away within them and furnished with suitable doors through which the cocks may be reached to open and close them, and through which the flexible branch pipes may be drawn out for filling the barrels or other vessels. S. J. Seely, of Brooklyn, N. Y., is the inventor of this improvement.

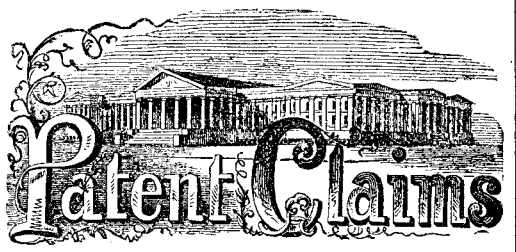
OIL A PRESERVATIVE AGAINST THE PLAGUE.—It is a singular but undoubted fact that as often as that fearful and contagious malady, the plague, has broken out and decimated the population of Smyrna, Constantinople, Candia and other parts of the Levant, there is not a single case on record of any one of the numerous kamalides or porters employed in the loading, unloading or transportation of oil ever having been attacked by, much less succumbed to, that dreadful scourge of the human species in the East. Indeed, so well is this known by the men themselves, that they fearlessly offer their services to carry the sick to the hospitals, bury the dead and attend on the sufferers.

THE DIGNITY OF LABOR.—The Connecticut House of Representatives is composed of 109 farmers, 15 merchants, 14 manufacturers, 13 lawyers, 9 mechanics, 3 clergymen, 3 physicians; teachers, editors, lumber-dealers, clerks, tobacconists, hotel-keepers, 2 each; ship-masters, printers, mariners, surveyors, glass-blowers, 1 each.

[The reader will notice that farmers come first, and bringing up the tail end of the list are *editors*, glass-blowers and lumber-dealers in very close proximity. It is an old saying that misery makes strange bed-fellows.—EDS.

BY the latest statistics of Australia, we learn that there are only 2,500 Americans in those British Colonies. Five years ago there were about 10,000: but most of them have returned to California.

© 1863 SCIENTIFIC AMERICAN, INC.



ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING JUNE 2, 1863.

Reported Officially for the Scientific American.

*** Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

38,719.—Railroad Car Truck.—C. R. Anderson, St. Louis, Mo. :

I claim, first, arranging the supporting beam, C, for the bolster, D, below the plane of the bottom of the truck frame, and making said beam a fixture with A, and a support for the ends as well as the center of the bolster, substantially as described.

Second, Supporting the ends of a centrally pivoted bolster, D, suspended upon pivoted quadrants, F F, which admit of a longitudinal movement and a depressed beam, C, substantially as described.

Third, The application of the center pivot bearing, consisting of plates, G G′, cylindrical box, G″, and a vertical key-head, d d′, in a car truck, constructed substantially as herein described.

Fourth, Making the base and side bearing for the hollow center pivot, an oil cup for lubricating the pivot, and also a chamber for keeping said pivot in place, substantially as described.

Fifth, A truck frame for railroad cars consisting of two side beams, A A, transverse beams, B B, depressed transverse bolster support, C, and the tapering bolster, D, arranged and operating substantially as herein described.

Sixth, The combination of plates, G G′, quadrants, F F, and beams, C D, all arranged substantially as described.

38,720.—Instrument for describing Ellipses.—J. B. Atwater, Chicago, Ill. :

I claim, first, The shaft, A, in combination with the slide, G, the ellipses, F', and the curved spring, f, the whole arranged in the manner and for the purpose herein specified.

Second, I claim the base, B, in combination with the center point, I, and the spiral spring, K, the whole arranged in the manner and for the purpose herein specified.

38,721.—Rotary Engine.—Cyrus Avery, Tunkhannock, Pa. :

I claim the circular plate, F, in combination with the valve, J, and slot, L, or its equivalent, for the purpose specified.

38,722.—Valve for Steam Engines.—John Baird, New York City :

I claim a divided slide valve for a steam engine, operating substantially as specified, or, in other words, I claim two slide valves working side by side, both capable of being moved and moving when the engine is hooked on, and one capable of being moved independently by hand, the two working under a mode of operation substantially as hereinbefore set forth.

I also claim, in combination, two valves operating substantially as specified, when one has less or more lap or lead than the other either on exhaust or steam, substantially as described and for the purpose specified.

38,723.—Grain-dryer.—H. H. Beach, Philadelphia, Pa.:

I claim, first, A series of inclined planes which the grain is caused to traverse in strata of uniform thickness, or nearly so, and on which the grain is caused to change its position by regulating the openings which form the communication between the planes, substantially as described; the planes being heated or perforated for the passage through them of a hot blast.

Second, In combination with the said inclined planes, arranged as set forth, I claim the sliding plate, d″, or its equivalent, for the purpose specified.

Third, The structure separated into the within-described hot-air compartments and exhaust compartments by the horizontal plates and inclined planes herein set forth, for the purpose specified.

38,724.—Hydraulic Propeller.—J. B. Booth, Portsmouth, Va. :

I claim the construction and combination of the cylinders and pistons, the crank shaft and intermediate shaft, and the pinions and cranks, substantially as and for the purpose specified.

38,725.—Unloading Freight or Merchandise.—Robert Bragg, San Francisco, Cal. :

I claim the plank, A, having ways, c c, attached to one or both sides in combination with the endless chains, B B, connected by crossbars, f, arranged or applied to the plank, substantially as and for the purpose herein set forth.

I further claim the guards or side strips, a a, applied to the plank, A, when used in combination with the ways, c c, endless chains, B B, and crossbars, f, as herein described.

38,726.—Mode of connecting Cars to Trucks.—Alfred Bridges, Newton, Mass. :

I claim hanging the car body by a spring or yieiding connection extending from the pedestal to the truck frame, and acting in the manner and for the purposes specified.

38,727.—Stove-pipe Thimble.—J. S. Brooks, Rochester, N. Y. :

I claim a stove-pipe thimble having the adjustable slide, C, or its equivalent, as and for the purposes shown and described.

I also claim the corrugated collar when so made as to hold the pipe by its inner points while the outer points or grooves carry the creosote into the flue.

38,728.—Sad Iron.—F. A. Cannon, New York City :

I claim the use of a slipper and roller in combination, made substantially as described, to fit on the bottom of smoothing irons attached thereto and removed therefrom by means of a spring catch.

38,729.—Still.—Hezekiah Clements, Warsaw, Ky. .

I claim the vertical shaft, H, and the paddles, k k, when used in connection with the worm, G, and steam space, a, substantially as and for the purpose described.

38,730.—Feed-water Heater for Locomotives.—Benjamin Crawford, Pittsburgh, Pa. Ante-dated Nov. 16, 1862 :

I claim, first, The arrangement, substantially as herein described, for heating feed water for locomotives by exhaust steam taken from the blast pipes at a point or points below the chimney or smoke-stack, as herein set forth.

Second, The valves, E E, applied and operated between the blast pipes, B B, and the heater, A, substantially as and for the purpose described.

Third, The valve, D applied and operated substantially in the manner and for the purpose described.

38,731.—Pianoforte.—David Decker, New York City :

I claim elevating the portion, C, of the plate in such manner that it passes entirely over a number of the longer or bass strings, e e, of the instrument, and enables the said strings to pass between it and the wrest plank, and so enables a wooden bridge, f, to be used upon the wrest plank for the support of those strings, and the said strings to be brought close to the wrest plank, substantially as and for the purpose herein specified.

38,732.—Process of burning Petroleum and other Liquid Fuel for the generation of Steam and other purposes. David Dick, Meadville, Pa. Ante-dated April 25, 1863 :

I claim the method of employing coal oil, petroleum, or other mineral oils, as fuel for the generation of steam or for other purposes, by saturating a bed or stratum of incombustible or refractory materials with the oil and burning it upon the surface thereof, substantially in the manner described.

38,733.—Grain Drill.—M. A. Dilley, Mendon, Mich. :

I claim the manner of adjusting, that is to say, raising and lowering the teeth, K, to wit, by means of the bar, M, having the teeth connected at its ends by chains, N N, to a bar, P, pivoted to a semicircular plate, Q, provided with holes, u; the bar, P, having a catch, R, attached to it, and all arranged as and for the purpore herein set forth.

[This invention relates to an improved seeding machine of that class which ars designed for sowing seed broadcast or in close drills, and which are provided with seed coverers arranged in such a manner as to cover the seed perfectly, and also to serve the office of cultivators when desired.]

38,734.—Mop.—R. H. Ewing, Elizabethtown, Ohio. Antedated March 11, 1862 :

I claim, as a new and improved article of manufacture, the mop substantially as herein described.

38,735.—Rag Engine of Paper-making Machines.—Jonathan Faw, Lockland, Ohio :

I claim the combination with the cap of a rag engine of the deflector, E, constructed and arranged as and for the purposes set forth.

38,736.—Pump.—Andrew Fitzpatrick, New York City :

I claim the rotary screw spindle, D, and crosshead, C, connecting by rods, a, with a piston moving in a pump cylinder, B, in combination with the longitudinally sliding clutch, G, wheels, E E′ F, and tappet rod, H, all constructed and operating substantially as and for the purpose shown and described.

[This invention consists in the arrangement of a rotary screw spindle connected with and acting on the piston of the pump in combination with a longitudinally sliding clutch and reversible bevel gear, in such a manner that, by the action of the reciprocating piston on suitable tappets, the clutch is shifted and the bevel gear reversed, and that by these means the screw spindle is made to rotate alternately in one direction and then in the other, and the continuous rotary motion of the driving wheel is converted into a rectilinear reciprocating motion of the piston.]

38,737.—Composition for Black Varnish.—J. P. Gay, Cincinnati, Ohio :

I claim the composition for black varnish consisting of the materials herein specified, combined in the proportions and substantially in the manner herein described.

38,738.—Corn Harvester.—George Geer, Douglas, Ill. :

I claim, first, The rotating cylinder, H, provided with a spiral rib, j, in combination with the endless chain, L, provided with arms, a′, arranged to operate in connection with the plates, J I, substantially as and for the purpose herein set forth.

Second, The endless toothed chain, M, in combination with the endless chain, L, provided with arms, a′, and the spiral-ribbed cylinder, H, as and for the purpose specified.

Third, The cutter, U, placed at the back part of the space, m, and arranged so as to be operated through the medium of a treadle, n′, and spring, n″, as set forth, but the cutter thus arranged to operate, I only claim when used in combination with the ribbed cylinder, H, and endless chains, L M, for the purpose set forth.

Fourth, The serrated wheels, f″ f′, in combination with the endless chains, L M, ribbed cylinder, H, plate, J, and bar, l, of the semicircular bars, k, for the purpose specified.

Fifth, The V-shaped plates, R R, attached to the frame, A, by hinges or joints and provided with rollers, T T, and bent rods, S, to operate as and for the purpose described.

Sixth, Constructing the frame, A, of two parts, a b, one part, b, having an inclined position relatively with a, when said frame, thus constructed is used in combination with the cylinder, H, endless chains, L M, plates, J I, all arranged as herein set forth.

[This invention relates to a new and improved machine for gathering ears of corn from the standing stalks, and it consists in the employment of a revolving cylinder provided with a spiral rib and fitted between guards, and using in connection therewith two endless chains, guide plates and a cutter, all so arranged and fitted upon a mounted frame as to operate in a perfect manner to effect the desired end.]

38,739.—Artificial Leg.—G. W. Hall, Lyndonville, N. Y. Ante-dated Dec. 27, 1862 :

First, I claim the ankle coupling, E, having a broad or double antero-posterior bearing, d g, connected with the leg, and transverse journal, f, connected with the foot, arranged and operating substantially as and for the purposes set forth.

Second, I also claim the means of adjusting and tightening the journal, f, consisting of the bearing pieces, j j, attached to the foot, as described, together with the clamp, k, and adjusting screw, l, substantially as set forth.

Third, I also claim connecting the jointed side irons, H, to the socket, D, by the pivot, n, to allow free motion or vibration thereof between the seams, o p, or corresponding limits of action, substantially as shown and described.

Fourth, I also claim the combination of the slot and movable bearing, s, screw-follower, t, and transverse screw, u, with the pivot, Q, of the jointed side irons, substantially as and for the purposes set forth.

Fifth, I claim connecting the lower portion of the leg, B, with the upper socket, D, by means of the elastic strap, U, and pad, T, arranged and operating substantially as set forth.

38,740.—Sewing Machine.—T. J. Halligan, New York City :

I claim the combination of the rock shaft, H, carrying an arm, H2, and a cam, L, the rock shaft, P, carrying arms, P″ P′, and a dog, N, and the springs, f and g, the whole arranged and applied in relation to each other and in connection with the shuttle-carrier and feed wheel, substantially as and for the purpose herein specified.

[This invention relates to [sewing machines in which a shuttle is used, and it consists in an improved combination of mechanism for driving the shuttle and feed mechanism, whereby the machine is much simplified.]

38,741.—Pocket-book.—Edward Hassenpflug, Boston, Mass. :

I claim, as a new article of manufacture, a self-closing pocket-book, provided with a spring or springs, a, and stops, c, as shown and described.

[The object of this invention is to arrange the flap of a pocket-book in such a manner that the same is rendered self-operating, or, more properly speaking, so that the flap closes down spontaneously whenever it has been opened, as soon as it is released.]

38,742.—Lamp Burner.—A. N. Henderson, Buffalo, N. Y.:

I claim, first, The isolated space, D, open at the top around the flame, without air holes around the bottom but with small holes connecting with the oil reservoir, constructed in the manner and for the purpose described and represented.

Second, I claim the said isolated air space in combination with the outer descending air space, E, with the various modifications of the cap for the formation thereof, so constructed as to admit the air, as herein described, and in some of the forms at the top also, so as to throw it at right angles against the flame, and in further combination with these devices the plate, F, now in use in other forms of lamps, all constructed in the manner and for the purpose herein substantially described and set forth.

38,743.—Railroad-car Platform.—Henry Holcroft and C. S. Smith, Chester Valley, Pa. :

We claim the slide, B, applied to the platform, A, and arranged with the spring, E, bent lever, D, lever, D′, and rod, F, and recess, f, in combination with the spring catch, G, and recess, c, in the platform, A′, all arranged as and for the purpose specified.

[This invention consists in the employment of a slide attached to one end of the platform of a car and arranged with a treadle, lever and spring, and used in connection with a catch applied to the end of the platform of an adjoining car, and also arranged with a treadle, whereby the slide may, by simply depressing the treadles with the foot, be thrown across the space between the ends of the platforms of the adjoining cars, so as to form a complete bridge, and when any person passes over from one platform to another, be released and thrown back to its original position.]

38,744.—Cooking Stove.—G. P. Hopkins, Albion, N. Y. :

I claim, first, The tubular perforated shaft, J, fitted in the lower part of the flue, G, and provided with the wing, c, and serrated plate, d, and placed in such position relatively with the fire chamber, A, and magazine, D, to operate as and for the purpose specified.

Second, The sliding or adjustable fire chamber, A, arranged as shown, when arranged and combined with the flues, G C, perforated shaft, J, and the magazine, D, as herein set forth.

[This invention consists in the employment of a magazine or coal receptacle for feeding the fire chamber with coal, and also in a novel arrangement of the grate or fire chamber, whereby the capacity of the same may be regulated as desired.]

38,745.—Machine for shaping Wooden Trays.—Ansel Howard, Jr., of Readsboro', Vt.:

I claim the combination of the separate carrier, D, and its adjustment, g g h h i l m n, or their mechanical equivalent or equivalents with the platform, C, and the rotary cutter or plane, B, the whole being applied and arranged with respect to one another in the manner and so as to operate substantially as specified.

I also claim the combination of one or more adjustable holdbacks, q, with the platform, C, and the rotary cutter, B.

I also claim the combination of the holdfast, u, with the platform, C, when combined with a rotary cutter, B, the whole being substantially as and for the purpose specified.

38,746.—Valve for Steam Engines.—J. S. Howell, Portsmouth, N. H.:

I claim, in combination with the steam cylinder, H, I claim the exhaust ports, C C, and passages, J J, steam chest, I, provided with valves, A A, balanced or nearly balanced, as described, and so constructed, arranged and operated as to supply steam to and exhaust it from each end of the cylinder, H, as required.

38,747.—Embalming Fluid.—F. A. Hutton, Washington, D. C. :

I claim the ingredients mixed in the manner and in the quantities as herein described, as a fluid for the purpose of embalming the dead.

38,748.—Composition for disinfecting and purifying Hospitals, Camps, &c.—J. L. Kidwell, Georgetown, D.C.:

I claim, first, The combination of sulphate of lime with the sulphate of magnesia, as set forth, for the production of a disinfecting, deodorizing and antiseptic compound or composition of matter.

Second, The combination of sulphate of lime and sulphate of magnesia with sulphate of copper, charcoal and coal tar, or either one or more of them, substantially as set forth.

38,749.—Friction Brake.—Richard Kitson, Lowell, Mass.:

I claim the brake composed of the disk, B, fast upon the shaft or axle, the toothed box, C, clamped upon the said disk, and the stop, E, to act upon the teeth of the box, the whole combined to operate substantially as and for the purpose herein specified.

[This invention is composed of a disk firmly secured to a shaft or axle and inclosed within a box or casing which is fitted to turn upon the shaft, but so clamped upon the said disk by means of screws as to produce any desirable degree of friction and which is furnished upon its periphery with a surrounding series of ratchet or other teeth, in relation to which a stop is so applied as to be capable of being made to engage with any tooth, and thereby to stop the revolution of the box and cause it, by its friction upon the disk, to gradually stop or retard the velocity of the revolution of the shaft.]

38,750.—Apparatus for cutting Card-board.—Lafayette Knickerbocker, Philadelphia, Pa. :

I claim cutting openings in card board by means of plates, E, arranged to inclose a space of the desired form and dimensions of the opening, in conjunction with the reciprocating block, G, or its equivalent, and the blades, H, arranged in a form corresponding to that of the space, when the cutting edges of the said blades are made of a concave or angular form, as described, for the purpose specified.

Second, The steel plates, E, secured to the adjustable plates, B, and arranged in respect to each other, as described, so that the space inclosed by the plates may be increased or diminished at pleasure, as set forth.

38,751.—Hanging Carriage Bodies.—Edward Lane, Philadelphia, Pa. :

I claim hanging the body of a vehicle to the front and rear axles of the same by means of the gum-elastic springs, H H and H′ H′, the levers, D D and D′ D′, the rods, G G and G′ G′, or their equivalents, arranged as set forth, when the spring of one lever is independent of the springs of the other levers, as described, for the purpose specified.

38,752.—Carriage Brake.—M. K. Lewis, Iowa City, Iowa :

I claim, in combination with a cam-shaped brake block arranged to turn on the brake bar, the links or chains which connect it to the axis or some part of the carriage, substantially as described, for the purpose set forth.

In combination with a crank-shaped brake bar I claim a cam-shaped brake block, for the purpose set forth.

38,753.—Apparatus for desiccating Vegetables.—William K. Lewis, Boston, Mass. :

I claim, first, The employment for the desiccation of vegetables, or other substances, at a temperature not above the boiling point of water, of a vessel, A, heated by the vapor rising from or through water heated in a vessel, B, which is open to the atmosphere, substantially as herein described.

Second, The combination, as herein described, of one or more rollers and one or more rakes, scrapers or stirrers, with each other and with a desiccating vessel, A, heated in the manner herein set forth.

38,754.—Lantern Globe.—Charles P. Lindley, Waterbury, Conn. :

First, I claim providing a lantern globe with an opening, a, for the purpose specified.

Second, In combination with the same, I claim the lip for the purpose described.

Third, I combination with the globe provided with the opening, a, I claim the use or employment of the reflector, C, or its equivalent, for the purpose herein set forth.

38,755.—Letter Envelope.—William Murphy, New York City :

I claim, first, Overlapping the flaps, b b′, with or without gum, when the same extend over the whole width of the sheet, A, as and for the purpose shown and described.

Second, The arrangement of marks, e g, opposite the points, d f, where the head flap, a, joints the side flaps, b b′, substantially as and for the purpose specified.

38,756.—Machinery for turning Logs on Saw-mill Carriages.—W. L. Oliver and A. J. Hancock, Indianapolis, Ind.:

We claim the movable elevators, H, constructed and operated substantially as described, and in combination with the additional head blocks, A, and the center blocks, L, for the purpose of facilitating the turning and raising of the log, in the manner described.

38,757.—Garment having Body and Sleeves.—Hermon Osler, Philadelphia, Pa. :

I claim a garment having body and sleeves drafted in one piece, and formed by the sutures, N H, O G, F P and R Q, on each side, substantially as shown and described.

38,758.—Process of utilizing the Tin from Tin-plate Clippings, &c.—J. M. Patterson, Woodbury, N. J. :

I claim utilizing or recovering the tin of the "waste clippings" of tin plates, substantially in the mode described.

© 1863 SCIENTIFIC AMERICAN, INC.

38,759.—Furnace of Sugar Evaporators.—A. H. Perry, Tipton, Iowa :

I claim, first, The arrangement of the hopper, H, with a trap door, I, and revolving grate, E, in combination with the flues, B D, leading from the furnace, A, to the chimney, the whole being constructed and operating in the manner and for the purpose substantially as described.

Second, So combining two furnaces, A and C, and their flues, B and D, that the fuel in the second furnace is dried and set on fire by the heat emanating from the fuel in the first furnace, substantially as set forth.

[The object of this invention is to use bagasse fresh from the crushing rollers as part of the fuel for heating the juice.]

38,760.—Lubricating Journals and Axles.—J. B. G. M. F. Piret, Paris, France :

I claim, first, The application within an axle or journal of what I have herein described as a "helicoid winged crown" rotating in contact with a stationary disk, h, or other equivalent flat surface, substantially as and for the purpose herein specified.

Second, The overlapping disk, n, encircling a flange, o, formed upon the inner end of the box, substantially as and for the purpose herein specified.

[This invention consists principally in a device which is termed the "helicoid winged crown" applied within an axle or journal box to provide for the more effectual lubrication of the axle or shaft, and its bearing.]

38,761.—Stopping Mill-stones.—Abner Reeder, Buckingham, Pa. :

I claim the funnel, G, or its equivalent, arranged in respect to the hopper of a mill, substantially as described, in combination with the devices herein set forth, or their equivalent, through the medium of which the rising of the said funnel, or its equivalent, when relieved from the weight or pressure of the grain, will cause the power from which the stones derive their motion to be arrested as described.

38,762.—Card for Liquid Compasses.—Edward S. Ritchie, Brookline, Mass. :

I claim the new or improved liquid compass card, substantially as herein before described.

38,763.—Leather-splitting Machine.—Bradford Rowe, Albany, N. Y. :

I claim, first, The elastic and flexible gage plate, in combination with the springs employed to keep its edge duly pressed upwards towards the roller.

Second, The roller having a center and side divisions of different diameters, the center division being the largest, and the others similar to each other, in combination with the knife and gage-plate.

Third, The treddles, in combination with the rods and springs.

38,764.—Head Lamp for Vessels.—Hugh Sangster, Buffalo, N. Y. :

I claim, first, The reflector made movable for the purpose set forth, by means of the two knobs, H and G, and the piece, K, or reflector-holder, or their equivalents.

Second, The lamp pot so arranged that it may be moved and its position changed inside of the lamp base by means of the knob, I, or its equivalent, on the outside of the lamp, for the purpose of adjusting it to the focus of the reflector.

Third, The manner described of attaching looking-glass and frame to the wings of the lamp, also the panel, or recess, which is stamped into the wing for its reception.

Fourth, The cone covered hot-air tubes, as described, and the grooves for the glass, bent and formed of the same pieces of metal as the top and bottom, as shown in Fig. 3 and lettered W W′ X X′, also the manner of holding the fruit glass (in the door) to its place, as shown in Fig. 7, and by the piece, Y′

38,765.—Car for carrying Petroleum, &c.—Samuel J. Seely, Brooklyn, N. Y. :

I claim, first, A railway car having its body composed of a corrugated or other sheet-iron cylinder, substantially as and for the purpose herein specified.

Second, The combination with the car body of one or more pipes, k k, arranged below the car, as described, and furnished with a series of flexible branches, l l, connected by cocks, k k, substantially as and for the purpose herein set forth.

Third, The boxes, n n, arranged as described, for the protection of the cocks, k k, and for the stowage of the flexible branch pipes, l l.

38,766.—Boot and Shoe.—Philander Shaw, Boston, Mass. Ante-dated Oct. 18, 1862 :

I claim, as a new article of manufacture, a boot or a shoe which is made of a flexible "upper" united with a sole composed wholly or in part of compressed wood; also the combined arrangement, operating substantially as shown and described, of the metallic plate, c, with the whole or a portion of the sole, when made of compressed wood.

38,767.—Press for forming Dies.—Max Henry Stein, New York City. Ante-dated April 9, 1863 :

I claim the arrangement of two hinged levers, E E, plunger, F, and bars, e, in combination with the main follower, D, and an adjustable press-box, H, constructed and operating substantially in the manner and for the purpose shown and described herein.

38,768.—Manufacture of Tooth-picks.—Benjamin F. Sturtevant, Boston, Mass. :

I claim, as a new or improved manufacture, for the purpose aforesaid, the making of tooth-picks with bevels or chamfers at the opposite ends of each, the blank or band of wood as made with the chamfers or bevels, at its opposite edges, and in other respects substantially as specified.

38,769.—Horse Rake.—Henry K. Stoner, Lancaster, Pa. :

I claim the construction and application of the tooth-head, A, with its perforated ears, D D, raised and notched flange, B f, for holding and securing the teeth, in the manner specified.

I also claim the supporting and projecting base, C, in combination with the projecting flange with its notch, for the additional purpose of attaching the springs, in the manner specified.

38,770.—Self-priming Hammer for Fire-arms.—Arthur F. Tait, Morrisania, N. Y. :

I claim the combination of the lever, C, spring, q, slide, B, and stop t n, with the hammer, A, magazine, b, and the inclined plane, r, in the manner and for the purpose herein shown and described.

38,771.—Iron-clad Vessel.—Lewis Tees, Philadelphia, Pa. :

I claim the combination of the prominent steel-tipped edge, b, the inclined portion of the vessel from the said edge to the spar-deck, A, and the inclined or curved portion from the edge, b, to a point below the water-line, the whole being arranged in respect to the gun-deck, B, as set forth for the purpose specified.

38,772.—Breech-loading Fire-arm.—Henry Underwood, Tolland, Conn. :

I claim, first, Combining the cylinder with the hammer by means of the ratchet teeth, c c d d, in the cylinder, arranged in different planes, and the dog, F, attached to the hammer and having two teeth, e f, set in planes to correspond with the ratchet teeth, substantially as and for the purpose herein set forth.

Second, The stop, G, applied in combination with the cylinder, C, and dog, F, and operated by a tooth on the said dog, substantially as and for the purpose herein specified.

Third, The cam, r′, and levers, s, applied in combination with the dog, F, substantially as and for the purpose herein specified.

[This invention relates to fire-arms having a single-chambered cylinder, the axis of which is arranged in a horizontal position transverse to the axis of the bore of the barrel, and it consists in so applying and operating such cylinder and so constructing the frame or stock of the arm that its chamber may be loaded through an opening n the top of the frame or stock, and that, by the act of loading, a previously-discharged cartridge shell or case may be pushed out through an opening in the bottom of the frame or stock. It also consists in certain means of combining the said cylinder with the hammer of the fire-arm, whereby the backward or upward movement of the hammer to the position of half-cock brings the cylinder to the position for loading, and the continued movement to the full-cock position brings the cylinder to the position for firing. It also consists n an improved arrangement of and mode of operating a stop for locking the cylinder in position for firing, and for disengaging it to enable it to be brought to the position for loading. And it further consists in a device for disengaging the cylinder from the hammer whenever desirable.]

38,773.—Maching for separating and dressing Ores.—Horace Trumbell, Jersey City, N. J. :

I claim, first, Giving to the water a sudden rising movement, followed by a slowly falling motion through the ore, substantially as herein shown and described.

Second, The disks, B B, arranged and operated by the cam wheels, C, and springs, G, in combination with the tank, A, ore box, I, and sieve or netting, e, as and for the purpose set forth.

[This invention consists in constructing a machine for separating or dressing ores in such a manner that a body of water may be suddenly impelled upward, at intervals, throughout the whole extent of a bed of ground ore, resting on a sieve, so as to raise and loosen the mass, and allow the heavier particles to settle to the bottom or to pass through the same. The box or sieve containing the ore, or other material to be operated upon, remains stationary.]

38,774.—Telegraph Magnet.—Silvanus F. Van Choate, New York City. Ante-dated April 26, 1862 :

I claim, first, The mode above described of making magnets, consisting of the parts, G F W W and H W′ W′, as and for the purpose specified.

Second, I claim the mode above described of constructing and arranging the armature, L, and lever, j, with reference to the coils and cores, in combination with the adjustable screw, m, as set forth.

Third, I claim the above-described mode of combining sounders and the several parts thereof with the adjustable screws and movable base to regulate the stroke of the hammer and to adapt such sounders to the varying strength of the magnetic forces than may be working the armature, as above specified.

Fourth, I claim the use in magnets of bells or sounders of different sizes, that is one smaller than the other, as and for the purpose set forth.

Fifth, I claim the sliding, moveable bar, F, Fig. 4, with its slotted connection, as and for the purpose set forth.

Sixth, I claim, in the construction of a magnet, the use of the parts described, viz., G F W W, and H W′ W′, in combination with the armature, L, lever, j, and bells or sounders, A and B, as and for the purpose specified.

38,775.—Water-Wheel.—Henry Van Dewater, Worcester, Mass. :

I claim, first The buckets, H, constructed as shown, so as to conform to the shape of the hub, G, and provided with the lips, k, and segment flanges, I, as and for the purpose set forth.

Second, The pendent lips, m, attached to the under side of the rim, l, of the hub, G, when arranged relatively with the buckets, H, to operate as and for the purpose herein set forth.

Third, The combination of the hub, G, buckets, H, provided with the lips, k, and flanges, I, the pendent lips, m, and case, C, provided with the chutes, D′, all arranged to operate as and for the purpose herein set forth.

Fourth, The inverted conical chamber, F, placed below or underneath the wheel, D, and inclosing the step of the shaft, E, as and for the purpose herein set forth.

[This invention relates to an improved water wheel of that class which are placed on vertical shafts, are enclosed within a case, and have a draught tube connected with the case. The invention consists in a peculiar construction of the wheel, the hub and buckets thereof, and also in a novel construction and arrangement of the case and water chamber in which the shaft of the wheel is stepped, whereby it is believed that a very efficient water wheel of the kind specified is obtained.]

38,776.—Damper.—P. Verbeck and O. T. Walker, Neenah, Wis. :

We claim a damper consisting of two segmental disks, A, which are connected by end pieces, B, provided with gudgeons, C, as and for purpose shown and described.

[This invention consists in the combination of two segmental disks united by end pieces, which are provided with gudgeons, in such a manner that the whole damper can be readily cast out of one piece, and no further labor is required to finish the same up, and, at the same time, the desired object of stopping the heat and allowing the smoke to ascend is fully obtained.]

38,777.—Car Spring.—Richard Vose and Charles D. Gibson, New York City :

I claim, first, Combining a central non-elastic core, B, with a coiled metallic spring, A, and one or more compensating springs, E F, substantially in the manner and for the purpose herein set forth.

Second, Combining a volute or a helical spring, with its supporting base, by means of a non-elastic core within said spring, united to said base, substantially in the manner and for the purpose herein set forth.

Third, Combining an elastic supporting disk or spring, F, with the metallic base, C, of a coiled metallic spring, substantially in the manner and for the purpose herein set forth.

38,778.—Link for Railway Horse-powers.—Seth Wheeler, Albany, N. Y. :

I claim, first, The connecting link, a b, constructed as described, in combination with friction rollers, d, endless chain links, e, and lag, H, substantially as and for the purpose described.

Second, The use of a link which has a short, hard-metal pin or journal, and a cast metal body, united together in the act of casting, for the purpose set forth.

38,779.—Thrashing Machine.—J. A. Woodward, Plattville, Wis. :

I claim the combination and arrangement of the suction spout, G, fan, J, screw, E, and screens, N O, when applied to a thrashing machine or arranged in relation with a thrashing cylinder, B, and concave, C, to operate conjointly therewith, as and for the purpose specified.

[The object of this invention is to obtain a machine of simple construction by which grain may be thrashed and separated from impurities at one and the same operation, and, at the same time, without allowing the dust and dirt to be expelled from the feed orifice or opening into the face of the attendant.]

38,780.—Cast-iron Bottom for Tea-kettles.—Leonard J. Worden, Utica, N. Y. :

I claim, as a new article of manufacture, making the bottoms of tea-kettles of cast-iron by uniting it to and with the body of the vessel, in the manner and for the purpose as herein described and set forth.

38,781.—Printing Press.—William H. Baker and George J. Hill (assignor to themselves, Jay Pettibone and Joseph Warren), Buffalo, N. Y. :

We claim, first, The combination of two or more reciprocating cross-heads, B, each carrying a "form" of type with an inking apparatus capable of inking each form of type with a different color, and an intermittent feed motion, whereby cards or railroad tickets may be printed in two or more different colors by one passage through the press, substantially as herein described.

Second, The giving of a vertical reciprocating motion to the cross-heads, B, by means of cams, E, of such form as will cause them to remain stationary a certain length of time at each end of their movement, in combination with a cam, J, for giving a reciprocating motion to the inking rollers, I I, of such figure as will cause the inking rollers to pass in under the cross-heads while they are up and stationary, and return, evenly distributing the ink upon the face of the type, and to then remain stationary during the down-and-up movements of the cross-heads, substantially as described.

Third, We claim the feeding arm, P, spring foot, Q, curved arm, P4, elliptic spring, P5, and spring-catch, S, the lifting toes, r2, and adjustable tripping screws, S′, with a feed-table having rollers, R, the whole combined and operating to form a variable intermittent feed-motion, substantially as described.

Fourth, We claim the arrangement of a number of the feeding arms, P, or their equivalents, upon a rock-shaft, P′, and their combination with a printing press, so that they may be made to feed simultaneously a number of distinct strips of paper or cardboard, and to give any length of "feed" desired to each strip, so that a number of different tickets of different lengths may be printed at each impression, substantially as herein set forth.

Fifth, We claim the combination with a printing press of circular revolving cutters by which a sheet or roll of paper or card-board may be cut into any required number of strips while passing through the machine, substantially as described.

38,782.—Machine for facing Grindstones.—James Bidwell (assignor to himself and William W. Marston), of New York City :

I claim, first, The tool rest, g, in combination with the adjustable frame, c, as specified, whereby said tool rest is moved up to the stone as the stone wears, as set forth.

Second, I claim the roller, f, composed of a series of metallic disks, and taking the entire face of the grindstone and pressed thereto substantially as and for the purposes specified.

Third, I claim the combination of the roller, f, tool-rest, g, and adjustable frame, c, for the purposes and as specified.

38,783.—Flour Bolt.—John C. Cookson, Lancaster, Pa. assignor to himself and David Reynolds, Indianapolis Ind. :

I claim the metallic bug-screen, F, with its oblong slots, as shown, surrounded by a cylinder, A, which opens, by its entire circumference, directly into the bolt, E, closed externally and connected with the screen, B, said bug-screen being closed on its inner end, and placed outside of the bolt, but on the same shaft, as shown, for the purpose specified.

I claim surrounding the bolt, E, with an external screen, B, provided with a cap or slotted bran-chamber, C, in combination with the cylinder, A, in the manner and for the purpose set forth.

I also claim the use of balls or knockers, when employed within a bug-screen.

38,784.—Water-proofing Cloth, Leather, &c.—William Elmer, New York City, assignor to Andrew McKinney, Boston, Mass. :

I claim rendering cloth and other texture impermeable to water and other fluids, by the application of an elastic coating, the selenide or sulphide of caoutchouc or gutta-percha, and giving increased body and durability to vegetable, woody and animal fibrous texture, as silks, woolens, leather, gelatineous tissue, prunella, cotton, linen, satins, mixed goods, &c., by first subjecting such goods or articles to the action of a solution of alumina (or its basic salts) or other true mordants and ichthyocolla, in such proportions and in such manner as to chemically combine the alumina and ichthyocolla and form an insoluble composition, which combines chemically with the fiber of the cloth, making the three a chemical compound; and subsequently subjecting the said goods to the series of actions, operations or processes of the chemical and other agents employed, as fully described in the foregoing specification; so that, by these various processes and substances employed, texture is added to a fibrous tissue, and chemically united, forming a compact body, possessing great tenacity, flexibility, and, at the same time, being water-proof. And this I claim, whether the precise chemicals before described are employed, and in the proportions named, or equivalent ones, and the processes varied, according to the nature of the article under treatment, or other processes, &c., be employed, which are substantially the same, by which analogous results are produced.

38,785.—Artificial Leather.—William Elmer, New York City, assignor to Andrew McKinney, Boston, Mass.:

I claim, first, Producing a durable artificial leather, from any kind of suitable cloth, woolen, cotton, linen, silk or mixed goods, by first filling the interstices or meshes of the same, with a compound of ichthyocolla, albumen, fextracture and fatty matter; in the proper proportions and then subjecting this compound to the action of tannic acid, or other agents capable of rendering it elastic and imputrescible or permanent.

Second, Alumina, or other true mordants are employed to unite chemically the various substances used, together with subjecting them to the various processes, manipulations and applications, as fully set forth in the foregoing specification under the head of "artificial leather," and this I claim whether the proportions of the substances employed and the processes, &c., detailed in this specification, be strictly observed or changed to suit different kinds of materials as for other purposes, and equivalent substances used without altering the real character of the processes, &c., or the results produced.

Third, The finishing of "artificial leather," so as to represent any kind of true leather, and producing a brilliant and durable polished surface on either artificial or true leather, by subjecting the same to the varnished coatings, compounds, applications, manipulations, &c., as fully set forth in this specification and for rendering all kinds of leather water-proof, as before described, by the selenide or sulphide caoutchouc or gutta-percha.

38,786.—Knife-cleaner.—Thomas M. Fell (assignor to John Mather Jones), Brooklyn, N. Y.:

I claim, first, The rotating cleaning disks, d, and e, faced with felt or other suitable material and kept together by a spring, in combination with the rests, k, and l, taking the knife as specified.

Second, I claim the grinding ring, n, applied as specified in combination with the cleaning disks, d and e, for the purposes and as specified.

38,787.—Machine for compacting Sugar, &c., in Barrels, Boxes, &c.—Gustavus A. Jasper (assignor to the Union Sugar Refinery), Charleston, Mass.:

I claim a machine, substantially as specified, that is to say, as consisting of a combination of the barrel platform, the shaft, the cushioned step, or their mechanical equivalents, and mechanism for elevating the shaft and allowing it to fall by gravity, the whole being arranged in manner and so as to operate as hereinbefore explained.

38,788.—Mode of Ventilating and Illuminating Risers.—Michael J. McCormick (assignor to Lewis R. Case), New York City :

I claim, first, The arrangement of a permanent perforated plate, with a sliding plate similarly perforated, the alternate apertures, or rows of apertures, being filled with glass, in the manner and for the purposes set forth.

Second, I claim the grooves, G G, upon the inside of one or both plates, communicating with the openings, c c c, in the front plate, substantially as specified.

38,789.—Gunpowder.—Johann F. E. Schultze, Potsdam, Prussia, assignor to himself and H. M. C. Wernich, Washington, D. C.:

I claim, first, The production of grains or particles from plates, sheets or veneers of wood, substantially in the manner set forth.

Second, The preparation of these grains or particles of woody substance, substantially in the manner set forth, for conversion into an explosive powder.

Third, Combining the grains or particles of wood or woody substance, thus prepared, with salts containing oxygen and nitrogen in this composition, for the production of an explosive powder, substantially as fet forth.

Fourth, The preparation of the dust or fine powder resulting from the preceding operations for the production of an explosive powder.

Fifth, The granulated explosive powder produced by the processes herein-before described.

38,790.—Grain-dryer.—Peter C. Schuyler & Sylvester W. Warren (assignor to Peter C. Schuyler), New York City:

We claim, first, The construction of a hollow metallic steam table connected together by the studs, 3 3, and heated by steam or hot water for drying grain or other substances as specified.

Second, We claim the arrangement of the shafts, w, cams, v, levers t, and chains or bands, s, in combination with the hollow metallic steam drying tables as specified.

Third, We claim the slide bars, h, adjustable as specified, in combination with the shafts, r, wheels, q, and shaking apparatus aforesaid, whereby said tables can be adjusted to the desired inclination, and agitated as set forth.

38,791.—Apparatus for burning Fluids for the generation of Steam, &c.—Thomas Shaw (assignor to himself and John L. Linton), Philadelphia, Pa. Ante-dated May 19, 1863 :

I claim, first, The construction of cone, G, substantially as and for the purpose set forth.

Second, The pipe, L, or its equivalent for conducting the air downwards over the cone, G, substantially as and for the purpose specified.

38,792.—Car Coupling.—Chas. D. Tisdale, East Boston, Mass., assignor to himself and Barna W. Tisdale, Boston, Mass.:

I claim the combination of the intermediate elastic cushion or link pad, E, with the link, B, and the bunter, A, the said link pad being affixed to the link and so as to operate as specified.

© 1863 SCIENTIFIC AMERICAN, INC.

38,793.—Buckle.—Luther Fogg, Boston, Mass.:

I claim a buckle composed of a frame shank, and grooved tongue that is jointed both to the frame and shank, in combination with the notches, i i, and lugs, f f, constructed and arranged as herein described.

38,794.—Machine for cleaning and opening Cotton, &c.—John E. Van Winkle, Paterson, N. J.:

I claim, first, The combination of the apron, I, and fan, H, with the parallel toothed shafts, C C′ a a, grid or grating, D, and feed aperture, g, where the said parts are arranged as herein set forth to cause the cotton to traverse the beaters longitudinally of the shafts, C C′, in passing from the feed aperture, g, to the apron, I.

Second, The combination of the oblique deflecting, ribs, w, with the feed aperture, g, longitudinally operating beaters, C C′ a, carrying apron, I, and fan, H, all arranged in the manner and for the purposes herein set forth.

Third, The opening or openings, e, for the admission of air at the feeding end of the machine beneath the grid or grating, D, in the described combination with the said grid or grating and with longitudinally operating beaters, C C a, carrying apron, I, and fan, H, all arranged and operating as set forth.

Fourth, The eccentric, Q, ratchet-wheel, c, and pawl, d, or their equivalents, employed in the described combination with the beaters C C′ a, and grating, D, to adjust the latter in its distance from the former.

Fifth, The suction fan, H, communicating with the interior of the rotary screen, F, in the manner and for the purposes specified when used in combination with the toothed beaters, C C′ a, and apron I, arranged and operating as set forth.

[This invention consists in the combination and arrangement of two series of rotary teeth or beaters, attached to parallel shafts above a suitable grating, a revolving cylindrical screen, a rotary suction fan, and an apron, whereby the opening and cleaning of cotton is effected in a very thorough manner, more expeditiously than by the machinery at present used for the purpose. It also consists in making the grating below the beaters adjustable, vertically nearer to or further from the teeth or beaters as may be desirable. We shall shortly publish an engraving of this improvement.]

38,795.—Grinding Mill.—Ausbent H. Wagner (assignor to Charles Kaestner & August Kaestner), Chicago, Ill.:

I claim, first, The nut on the top of the hollow shaft, to hold down the running stone and prevent the stationary stone from lifting or raising it.

Second, In combination with the hollow stationary shaft I claim the metal bed-plate to which it is fastened.

38,796.—Rake for Harvesters.—George Hall, Baltimore, Md.:

I claim mounting the rake head on an arm provided with a telescopic slide, substantially in the manner described, in combination with a guide slot in the platform, for the purpose of controlling the movements of the rake as set forth.

38,797.—Concussion Fuse for Explosive Projectiles.—J. L. Henry, late of the U. S. Army, assignor to Richard P. Henry, of Kentucky:

I claim, first, The employment of a conical plunger, B, as described, in combination with an enlarged chamber, Q, and suitable concave seat for the purpose of allowing a very wide lateral range of motion of the said plunger in case of an oblique impact of the shell.

Second, The method of holding the plunger safely in its seat by means of the rotating rod, u, with its catch or stop, r, and rear valve attachment, v, whereby it may be released only by the purpose of the discharge upon the said valve, in the base of the shell, substantially as described.

Third, The additional holding device of a hook or elbow stop, s, fixed in the cylindrical seat-piece, c, and a pin, i, in the plunger; or as an equivalent thereof, the use of the centrifugal balls, q, for the purpose of retaining the plunger securely, until released by the rotation of the projectile, due to the rifling of the gun, substantially as described.

Fourth, The employment of a friction tape, O, in connection with the conical plunger, in the manner and for the purpose set forth.

Fifth, The combination with the conical plunger and friction tape, the twine or check-string, t, to prevent the released plunger from straining and igniting the primer, before the shell impinges, substantially as described.

Sixth, In concussion shells, a chamber for the plunger, of such dimensions as that the plunger may move freely, not only directly forward as usual, but also sidewise, and perform its function even before reaching the sides of its chamber, in case of side impact, substantially as described.

Seventh, The use of two sets of "stops," the one rigid, the other to yield on impact, as and for the purposes set forth.

38,798.—Feed Ration for Army Use, &c.—William H. Page, New York City:

I claim the ration composed and prepared substantially as described.

38,799.—Corrugating Metal Plate.—Joseph Francis, New York City:

I claim forming a corrugation in a plate of metal which stops short of the edge of said plate, substantially of the same thickness as the flat straight edge, substantially as and for the purposes set forth.

38,365.—(Patented April 28, 1863.)—Mark-holder for Bales, &c.—Henry W. Goodrich, Chelsea, Mass., and Edward A. Locke, Boston, Mass.:

We claim as a new article of manufacture a device constructed substantially as described with barbs, corners, or indentations, or otherwise so shaped and arranged as to render it easy of insertion in, and difficult of extraction from, packages of fibrous material, when said device is provided with means for securing thereunto or thereon an identifying mark or label or is itself impressed with an identifying mark.

RE-ISSUES.

1,488.—Lamp.—E. B. Requa, Jersey City. Patented May 6, 1862:

I claim, first, The tube, G, made of metal with its metal deflector, H, insulated by plaster of paris, or other good non-conducting cement, or made of glass with the deflector, H, fitted upon it without cement.

Second, The tube, J, made of glass with its deflector, I, of metal insulated by plaster-of-paris or other good non-conducting cement.

Third, The combination of the two tubes, G J, one placed within the other and the inner one including the wick-tube, E, when said tubes are constructed with deflectors so as to admit of a space, e, between them, having a narrow passage, e′, to increase the rapidity of the draught against the sides of the flame, substantially as and for the purpose herein set forth.

Fourth, Providing the lower end of the wick-tube, E, with a cap, F, to serve as a top for the fountain, A, when said cap is used in connection with the tube, G, applied to the burner, D, the latter screwed into the jacket or case, B, and all arranged as shown to form a simple device to admit of the flame being supplied with a requisite quantity of air at its base and by a current which passes around the fountain, A, to keep its contents cool as herein described.

Fifth, The combination of the two tubes, G and J, cones, H I, wick-tube, E, cap, F, burner, D, flange, g, jacket or case, B, and fountain, A, in short, the whole lamp all arranged and constructed as and for the purpose and in the manner represented and described.

1,489.—Inkstand.—William H. Towers, Boston, Mass., late of New York City. Patented Oct. 2, 1860:

I claim an inkstand the cap or cover of which consists of two concentric plates or disks, one above the other, and perforated by a correspondingly eccentric hole, the lower of said two plates being provided with a flange or rim raised around its hole in such a manner as to avoid all leakage of ink between the plates, and made to operate substantially as above described.

1,490.—Alarm Whistle.—Noyes D. Lamb & Ansel Clark, (assignees of Noyes D. Lamb), Norwich, Conn. Patented Oct. 8, 1861:

We claim the combination of the mouth-piece, receiving cylinder, and sounding cup or bell, constructed and operating together substantially as herein described.

DESIGN.

1,762.—Brooch.—M. Austine Snead, Louisville, Ky:

EXTENSIONS.

Direct and Counter-motion Winch.—Charles Perley, New York City. Patented May 29, 1849:

I claim the application of the female ratchet 13, conjointly with the mechanical arrangement of the head or cap, d, with the two reversing pawls, 9 and 10, and lever socket 7, to produce a winch, that shall be worked by a hand-spike or lever, moving in either direction on the winch center, for the purposes and substantially in the manner before described.

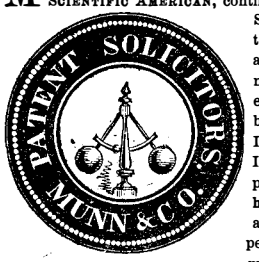
Bedstead Fastening.—Devolt Stollemeyer, Hancock, Md. Patented May 29, 1849:

I claim the construction of metallic fastenings for confining the rails and posts of bedsteads to each other, of such forms that when the portions of the fastenings secured in the ends of the rails are inserted into the portions of the fastenings attached to the posts, a blow or downward pressure upon the rails, will cause the ends of the rails to be closely drawn against and secured to the posts; when this is combined with the arrangement by which the elevation of the rails for a short distance will permit them to revolve and detach themselves from the cords or sacking that may be connected to them, and also disconnect the portions of the fastenings projecting from the extremities of the rails from their hold upon the fastenings made fast to the posts, without withdrawing one from the other, substantially in the manner and for the purpose herein set forth.

IMPORTANT TO INVENTORS

PATENTS FOR SEVENTEEN YEARS.

MESSRS. MUNN & CO., PROPRIETORS OF THE SCIENTIFIC AMERICAN, continue to solicit patents in the United States and all foreign countries, on the most reasonable terms. They also attend to various other departments of business pertaining to patents, such as Extensions, Appeals before the United States Court. Interferences, Opinions relative to Infringements, &c. The long experience Messrs. MUNN & Co. have had in preparing Specifications and Drawings, has rendered them perfectly conversant with the mode of doing business at the United States Patent Office, and with the greater part of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.



THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent free of charge. Address MUNN & CO. No. 37 Park Row, New York.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of $5, accompanied with a model or drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands such examinations have been made through this office. Address MUNN & CO., No. 37 Park Row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by draft on New York, payable to the order of MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank-bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row, New York.

The revised Patent Laws, enacted by Congress on the 2d of March, 1861, are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the Government fee required on filing an application for a patent is *reduced* from $30 down to $15. Other changes in the fees are also made as follows —

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design, three and a half years	$10
On filing application for Design, seven years	$15
On filing application for design, fourteen years	$30

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (but in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

During the last seventeen years, the business of procuring Patents for new inventions in the United States and all foreign countries has been conducted by Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN; and as an evidence of the confidence reposed in our Agency by the inventors throughout the country, we would state that we have acted as agents for at least TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees at home and abroad. Thousands of inventors for whom we have taken out patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the inventors whose patents were secured through this office, and afterward illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than are employed at present in our extensive offices, and we are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

REJECTED APPLICATIONS.

We are prepared to undertake the investigation and prosecution of rejected cases on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief story of the case, inclosing the official letters, &c.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The Government fee for a caveat, under the new law, is $10. A pamphlet of advice regarding applications for patents and caveats, printed in English and German, is furnished gratis on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

FOREIGN PATENTS.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through the Scientific American Patent Agency, No. 37 Park Row, New York.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through our Agency, the requirements of different Government Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park Row, New York, or any of our branch offices.

ASSIGNMENTS OF PATENTS.

Assignments of patents, and agreements between patentees and manufacturers are carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row New York.

It would require many columns to detail all the ways in which inventors or patentees may be served at our offices. We cordially invite all who have anything to do with Patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of patentees will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid), should be addressed to MUNN & CO., No. 37 Park Row, New York.

TO OUR READERS.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of our reception of their funds.

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known and inclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

Models are required to accompany applications for Patents under the new law, the same as formerly, except on design patents when two good drawings are all that is required to accompany the petition, specification and oath, except the Government fee.

NEW PAMPHLETS IN GERMAN.—We have just issued a revised edition of our pamphlet of *Instructions to Inventors*, containing a digest of the fees required under the new Patent Law, &c., printed in the German language, which persons can have gratis upon application at this office. Address MUNN & CO., No. 37 Park-row, New York.

Binding the "Scientific American."

It is important that all works of reference should be well bound. The SCIENTIFIC AMERICAN being the only publication in the country which records the doings of the United States Patent Office, it is preserved by a large class of its patrons, lawyers and others, for reference. Some complaints have been made that our past mode of binding in cloth is not serviceable, and a wish has been expressed that we would adopt the style of binding used on the old series, *i. e.*, heavy board sides covered with marble paper, and morocco backs and corners.

Believing that the latter style of binding will better please a large portion of our readers, we shall commence on the expiration of this present volume to bind the sheets sent to us for the purpose in heavy board sides, covered with marble paper and leather backs and corners.

The price of binding in the above style will be 75 cents. We shall be unable hereafter to furnish covers to the trade, but will be happy to receive orders for binding at the publication office, 37 Park Row, New York.

Back Numbers and Volumes of the Scientific American.

VOLUMES I., II., III., IV., V. AND VII. (NEW SERIES) complete (bound or unbound) may be had at this office and from periodical dealers. Price, bound, $2 25 per volume, by mail, $3—which include postage. Price, in sheets, $1 50. Every mechanic, inventor or artizan in the United States should have a complete set of this publication for reference. Subscribers should not fail to preserve their numbers for binding. Nearly all the numbers of VOL. VI. are out of print and cannot be supplied.

© 1863 SCIENTIFIC AMERICAN, INC.

Notes and Queries

R. H., of Pa.—Smoke-burning locomotives are common in England, where bituminous coal is employed, but such are not required where anthracite is used for fuel. The common principle of consuming their smoke is to admit warm air through a bridge-wall at the back of the fire-box. The warm air mingles with the smoke and supplies it with the requisite amount of oxygen. Another method consists in supplying the warm air through a perforated furnace door, behind which is a box forming part of the door, where it is heated and passes in streamlets through holes to the fire. You will find it difficult, if not impossible, to operate satisfactorily a smoke-consuming locomotive in a coal mine, because it will consume so much air and generate so much carbonic acid gas, as to render the mine unendurable to the miners.

T. J. R., of Ohio.—Sound is produced by the vibrations of the atmosphere, and the sensation is conveyed to the mind through the nerves of the auditory organ. It is waste of time to dispute the question whether sound exists independent of the sense of hearing, or not, because sound would be unknown but for that sense.

C. C., of D. C.—What is meant by stating that "aniline exists in coal oil" refers only to the crude product of coal distilled at a lower temperature than destructive distillation. The benzole is usually extracted from the naphtha. As you state, true benzole does not exist, so far as we have ascertained, in petroleum.

W. M. M., of Wis.—We have no copies of No. 1, Vol. V. (new series) of the Scientific American.

C. C. P., of Ohio.—You have not clearly expressed what information you desire to obtain respecting your copper tubes, or we should have cheerfully given it.

Walter Brown, of La Crosse, Wis., wishes to purchase a machine for making round matches.

C. E. L., of Mo.—We cannot decide upon your articles until we see them. The subject is rather hackneyed, but you may be able to present some new views of it.

G. W. H., of N. Y.—Several patents have been granted for machines capable of sawing two sides of a tapering marble monument. By referring to the back files of the Scientific American you will find the claims.

C. S. M., of Mass.—A machine for turning off grindstones and keeping them true, while in use, was patented on June 5, 1860, and illustrated in Vol. VI (new series), No. 32, on page 376 of the Scientific American, by George C. Howard, of Philadelphia. Address him for further information at No. 15, South Eighteenth street, Philadelphia. It is said to be an excellent machine.

D. E., of N. Y.—We think but few of our readers would be interested in the subject of lenses, or the difference between one kind and another.

C. C. S., of Mass.—You will find an illustrated description of Dr. Page's electro-magnetic engine on pages 65 and 68, Vol. VII. (old series) of the Scientific American. There is no manufactory of electro-magnetic engines in the country, but any maker of electrical apparatus will make you one to order.

J. H. M., of Mass.—We have answered this question so many times that we must refer you to Vol. VII (new series), No. 12, page 187, of the Scientific American for a full account of the way in which engineers are appointed to the navy.

A. J. C., of Ohio.—We think your case is in the hands of reliable men. That class of claims in which yours is ranked has not yet received attention from the Government, and it is impossible for the agents, mentioned in your letter, to say when they will be attended to. They state that they have several similar cases and are urging their consideration at the hands of the Government as much as they can. We sympathize with your misfortunes, but have patience and you will doubtless be rewarded.

F. G. M., of Mich.—We advise you to procure a steam engine by all means. There are no caloric engines in the market of the size and power you want, or that would at all suit your purpose. You will find an oscillating or a vertical cylinder engine preferable to the cheap horizontal engines sometimes offered for sale.

W. T., of N. Y.—We are not in possession of the displacement of the steamers *City of Baltimore* or *Merrimac*, nor yet their relative horse-power. The paragraph in question was copied from a daily journal. The subject is important, as you say, but we do not think that the requisite information could be obtained, especially the details of the construction of the *City of Baltimore*, by inserting your letter. The *Merrimac's* superiority doubtless lies in her model, and it is a notorious fact that, notwithstanding the "hue and cry" made in the daily papers about our slow steamers, we have vessels capable of outrunning the English ships, when they are in proper order. A steamer on blockade duty is hardly in a fit condition to run a race, yet all of the fastest English blockade runners, about which so much is said, have been caught and made prizes.

Money Received

At the Scientific American Office, on account of Patent Office business, from Wednesday, June 3, to Wednesday, June 10, 1863:—

R. H. G., of N. Y., $75; J. G. W., of N. Y., $275; G. F. J. C., of N. J., $20; W. D., of Ohio, $20; G. N. D., of Ky., $20; J. B., of Iowa, $20; E. C., of N. Y., $16; J. McC., of N. Y., $10; W. M. D., of N. Y., 41; E. P., of Ill., $20; M. C E., of N. Y., $20; M. B. W., of Conn., $45; A. C. F., of N. Y., $36 T. R., of N. Y., $44; T. F. B., of N. Y., $16; J. B. C., of Conn., $16; J. D. W. W., of N. Y., $16; L. and H. of Mass., $30; B. and B., of N. Y., $20; F. C. P., of N. J., $20; L. and H., of Pa., $20; J. I., of Ohio, $20; H. and W., of Ohio, $17: A. B., of N. Y., $16; F. B. P., of Mass., $10; A. W., of N. Y., $20; H. M., of N. Y., $46; J. F. McK., of Pa., $20; J. K. H., of Ind., $20; W. M. B., of Ind., $85; N. A. B., of N. Y., $21; A. T. W., of Md., $45; J. W., of Iowa, $15; R. D. N., of N. H., $25; A. S., of Ill., $25; J. F., of N. Y., $25; H. J. D., of Ill., $15; I. J. F., of Iowa, $15: A. B. K., of C. W., $22; A. W., of N. Y., $25; J. and S., of Mich. $25; A. B., of Vt., $25; C. W. T., of Mich., $15; G. W. W., of Pa., $16; S. P. La. D., of Iowa, $15; J. T., of Wis., $16; R. H. B., of N. Y., $25; L. and B., of Ohio., $30; R. P. P., of Wis, $35; L. and S. B. H., of Mass., $16; G. M., of Ill., $15; J. H. A., of Mich., $26; E. B., of Mass., $25; T. J. B., of Ohio, $16; J. H. C., of Va., $20; W. McK., of Pa., $16; R. B. R., of N. Y., $46; D. H. and P., of Wis., $15; G. C., of N. J., $16; J. K., of Cal., $16; C. M., of Mass., $25; W. M. B., of Ind., $85; W. H. M., of Conn., $41 J. B. S., of Ill., $15; H. H. J., of Conn., $25; S. W., of Mass., $25; I. S. A., of Mass., $25; W. B. R., of Mich., $25; E. P., of Md., $25; S. T. S., of Mass., $16; C. H. P., of R. I., $12; G. and H., of Mass., $16; A. C. F., of N. Y., $16; C. M., of N. Y., $20; J. H. J., of N. Y., $86.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, and inform us the amount, and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from Wednesday, June 3, to Wednesday, June 10, 1863:—

J. F., of N. Y.; A. S., of Ill.; R. D. N., of N. H.; A. B., of Vt.; J. and S. of Mich.; R. H. B., of N. Y.; A. W., of N. Y.; L. and B., of Ohio; R. P. P., of Wis.; F. and K., of Cal. (2 cases); D. G. H., of Mass.; E. P., of Md.; S. W., of Mass.; W. B. R., of Mich.; J. H. A., of Mich.; J. S. A., of Mass.; H. H. J., of Conn.; C. M., of Mass.; T. R., of N. Y.; C. H. P., of R. I.

Magazines and other Publications received.

The Practical Draughtsman. Published by Henry Carey Baird, Philadelphia.

This work is one of practical utility to every person connected with the mechanic arts. Its tables of contents embraces treatises on and illustrations of gearing, slide valves, steam cylinders and their appurtenances, and many other specialities, which will be found extremely valuable to all, whether proficient or unskilled in science. Also, in regard to perspective, application of shading to gears, screws and kindred matters, these are fully and clearly explained in the letter-press accompanying the examples given. The work is very handsomely issued by Mr. H. C. Baird, the enterprising publisher, and is sold for $7 50. It is a large single volume, quarto, and will be a valuable addition to any library. We frequently receive letters from our patrons desiring information as to where they can procure standard mechanical books. We would refer all such to Mr. Baird; he is making this branch of book-publishing a special feature, and should be sustained by the mechanical community at large. His advertisement will be found in another column.

Treatise on the Parabolic Construction of Ships and other Marine Engineering Subjects. By J. W. Nystrom, C. E. Published by J. B. Lippincott & Co., Philadelphia.

We have received a treatise on the parabolic construction of ships by John W. Nystrom, C.E., and we owe the author an apology for delaying a notice of his work so long. The work is carefully written and is issued with the object of obtaining more positive rules for the principal lines of a ship or other vessel, as the load water-line, rails n plan, cross-sections, displacement, sheer, &c. These rules are intended to be arbitrary, and by their exercise the most inexperienced ship-builder can lay down as fine a vessel as the most skillful person in his trade In addition to the examples given, which are fully illustrated, Mr. Nystrom furnishes a compendious account of iron-clad ships and specifications for an armored corvette proposed for the Government. The work will be found useful to all those whose interests lead them to investigate the subject therein treated on.

Encyclopedia of Chemistry. By Professor James Booth, A. M., Melter and Refiner at the U. S. Mint. Published by Henry Carey Baird, Philadelphia.

Chemistry touches all arts—agriculture, metallurgy, medicine, dyeing, painting, bleaching, tanning, photography, telegraphy, &c., and as a humorous lecturer upon it once said: "a knowledge of it will benefit every man who boils a kettle and every woman that makes a pudding." We welcome all new books and publications which are reliable and intended to disseminate correct chemical information; and the above mentioned is a volume of this character. It is the seventh edition of a work pubished several years ago. Its editor, Professor Booth, of Philadelphia, is a thorough analytical and manufacturing chemist. It is a standard work—a book of ready reference, as useful to the chemist and manufacturer as a dictionary of language to the scholar. It contains definitions and descriptions of known substances and chemical proce sses. We have used it constantly and have always found it to be very convenient and reliable.

RATES OF ADVERTISING.

Twenty-five Cents per line for each and every insertion, payable in advance. To enable all to understand how to compute the amount they must send in when they wish advertisements inserted, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

JOHN WILEY, 535 BROADWAY, NEW YORK, IMPORTS and offers for sale, Truson on the Iron Manufactures of Great Britain. 1 vol., 4to., 84 steel plates, 2d edition, $20; Bourne's Treatise on the Steam Engine. 1 vol., 4to., last edition, $21; Bourne's Catechism of the Steam Engine. 1 vol, 18mo., plates, last edition, $3; C. Wye Williams on Heat, Water and Steam. 1 vol., 8vo., $3 75; Samuel Clegg on the Manufacture of Coal Gas—last edition, $12; Gwill's Encyclopedia of Architecture—last edition, $12 50; Cressy's Encyclopedia of Civil Engineering—last edition including supplement, $18; Humber on Cast and Wrought-iron Bridges. 2 vols., 8to., last edition, $55, &c. Scientific catalogue gratis and mailed to any address. 1*

COTTON GINS! COTTON GINS!! THE NEW YORK Cotton Gin Company manufacture and offer for sale the Excelsior Roller Gin for Sea Island or long staple cotton; also Brown's celebrated Double-cylinder Saw Gin for upland or short staple. The above Gins are acknowledged to be without their equal; they do more work and produce a better sample than any offered in the market. We also manufacture a large variety of hand Gins, both for long and short staples. Persons intending to order for the coming crop of cotton will do well to do so soon, in order to secure their Gins in season. FRANKLIN H. LUMMUS, General Agent, No. 82 John street, New York. 25 13

ULRICH AND DUSSAUCE'S DYES OF PARIS, Rouen, Mulhousen, Germany and of the Gobelins of Paris. Just ready, a complete treatise on the Art of Dyeing Cotton and Wool, as practiced in Paris, Rouen, Mulhousen and Germany. From the French of M. Louis Ulrich, a practical dyer in the principal manufactories of Paris, Rouen, Mulhousen, &c., to which are added the most important receipts for Dyeing Wool, as practiced in the Manufactory Imperiale des Gobelins, Paris. By Professor H. Dussauce, Chemist, lately of the Laboratories of the French Government, viz., the Mining, Botanical Garden, the Imperial Manufacture of the Gobelins, the Conservatoire Impériale of Arts and Manufactures; Professor of Industrial Chemistry to the Polytechnic Institute, Paris. In one volume, 12mo., price $3.

Contents:—Part I. Dyeing Cotton. First Section.—Dyeing on Threads. Chapter I.—*Dyeing of Rouen*—Mordants—Preliminary operations—Apparatus—Rouen receipts for dyeing—Stiffening for white cotton—Scotch thread. Chapter II.—*Alsacean Dyes.*—Mordants—Preliminary operations—Apparatus—Formulæ of modern dyes—Old shades—Stiffening for Scotch thread—Ireland thread and bordering. Chapter III.—*German Dyes (Saxony and other Places.)*—Mordants and acids to brighten—Receipts to dye. Second Section.—Dyeing on Tissues, Mulhousen Lustrings.—Bleaching of tissues of cotton—Mordants—Receipts to dye—Sizings. Part II. Parisian Wool Dyeing. First Section.—Dying on Threads.—Chapter I.—*Boilings and Compositions.* Chapter II.—*Receipts to Dye.* Second Section.—Merinos. Chapter I.—*Mordants and Dissolutions.* Chapter II.—*Receipts to Dye.* Third Section.—Dyes on Wool from the Gobelins. Chapter I.—*Scouring, Mordants, &c.* Chapter II.—*Bleaching and Whites.* Chapter III.—*Receipts to Dye—Index.*

Also just ready, a Treatise on the Coloring Matter derived from Coal Tar; their Practical Application in Dyeing Cotton, Wool and Silk; the Principles of the Art of Dyeing and of the Distillation of Coal Tar; with a Description of the most Important New Dyes now in use. By Professor H. Dussauce, Chemist. 12mo., $2 50.

Contents:—Historical Notice of the Art of Dyeing; Chemical Principles of the Art of Dyeing; Preliminary Preparation of Stuffs; Mordants; Dyeing; On the Coloring Matters produced by Coal Tar; Distillation of Coal Tar; History of Aniline; Properties of Aniline; Preparation of Aniline directly from Coal Tar; Artificial Preparation of Aniline; Preparation of Benzole; Properties of Benzole; Preparation of Nitro-benzole; Transformation of Nitro-benzole into Aniline by means of Sulphate of Ammonium, by Nascent Hydrogen, by Acetate of Iron and by Arsenite of Potash; Properties of the Bi-nitro-benzole; Aniline Purple; Violine; Roseine; Emeraldine; Blue de Paris; Futschine or Magenta; Coloring Matter obtained by other Bases from Coal Tar; Nitroso-phenyline; Di-nitro-aniline; Nitro-phenyline; Picric Acid; Rosolic Acid; Quinoline; Naphthaline Colors; Chloroxynaphthalic and Perchloroxynaphthalic Acids; Cerminaphtha; Nisapthalatnine; Nitsoson Aphthaline; Naphthamein; Tar red; Azuline; Application of Coal Tar Colors to the Art of Dyeing and Calico Printing; Action of Might on Coloring Matters from Coal Tar; Latest Improvements in the Art of Dyeing; Chrysammic Acid; Molybdio and Picric Acids; Extract of Madder; Theory of the fixation of Coloring Matters in Dyeing and Printing; Principles of the Action of the most Important Mordants; Aluminous Mordants; Ferruginous Mordants; Stanniferous Mordants; Artificial Alzarine; Metallic Hyposulphite as Mordants; Dyer's Soap; Preparation of Indigo for Dyeing and Printing; Relative Value of Indigo; Chinese Green; and Murexide.

Blues and Carmines of Indigo. A Practical Treatise on the Fabrication of every Commercial Product derived from Indigo. By Felicien Capron des Dole. Translated, with important additions, by Professor H. Dussauce. 12mo. $2 50.

Dyer and Color-maker's Companion. 12mo., 75 cents.

The Art of Dyeing, Cleaning, Scouring and Finishing on the most approved English and French Methods; being Practical Instructions in Dyeing Silks, Woolens and Cottons, Feathers, Chips, Straw, &c.; Scouring and Cleaning Bed and Window Curtains, Carpets, Rugs, &c.; French and English Cleaning, any Color or Fabric of Silk, Satin or Damask. By Thomas Love, a Working Dyer and Scourer. In 1 vol., 12mo., $3.

The Dyer's Instructor; comprising Practical Instruction in the Art of Dyeing Silk, Cotton, Wool and Worsted, and Woolen Goods, containing nearly 800 Receipts. To which is added a Treatise on the Art of Padding; and the Printing of Silk Warps, Skeins and Handkerchiefs and the various Mordants and the Colors for the different styles of such work. By David Smith, Pattern Dyer. 12mo., cloth, $3.

Chemistry applied to Dyeing. By James Napier. 12mo., $2.

☞ The above, or any of my books, sent by mail free of postage. Every reader of the Scientific American is particularly invited to send for a catalogue, which will be sent free of postage. HENRY CAREY BAIRD, Publisher of Practical and Scientific Books, 406 Walnut street, Philadelphia. 1

B. T. BABBITT ON MAKING BREAD, WITH FULL directions on each package of Salaratus, showing how to make the best of bread from materials that farmers always have on hand. Bread made in this manner contains nothing but flour and common salt and water; it has an agreeable taste; keeps much longer than common bread; is more digestible and much less disposed to turn to acid. Common bread, like every thing that has been fermented, ferments again to the great discomfort of many stomachs, and not only so, but acting as a ferment, it communicates to all food in contact with it. The bread being free from all yeasty particles, is more digestible and not so likely to create flatulence or turn acid on weak stomachs as fermented bread is apt to do, and, when of the finest quality, it is beneficial to those who suffer from headache, acidity, flatulence, eructations, a sense of sinking at the pit of the stomach, distension or pains after meals, and to all who are subject to gout or gravel; it is also useful in many affections of the skin; a saving of 25 pounds of flour per barrel is effected by this process. Be sure and get that with B. T. BABBITT'S name on, or you will not get the recipe with sour milk, nor the quality. For sale by store-keepers generally or at the manufactory, Nos. 64 to 74 Washington street, New York. 25 tf

FOR SALE.—THE ENTIRE PATENT RIGHT FOR A valuable Agricultural Machine. The above machine is operated by hand, steam or horse-power, and will husk 50 bushels of ears of corn per hour. It separates the butts or stalks and husks the ear with once handling the corn. A full-size machine can be seen in operation at the office of the patentees, No. 139 Thames street, Newport, R. I. Address P. O. Box 600, Newport News, R. I. 25 3*

HOMAN'S "EXCELSIOR" HORSE HAY RAKE.—Those wishing rights in the best, either for manufacture or speculation, should apply immediately. New England States already disposed of. Described in Nos. 22 and 25, Vol. VIII. (new series), of the Scientific American. Circulars sent free. C. B. HOLMES, Dowagiac, Mich. 25 6*

WANTED—A CLAY-PIPE-MAKING MACHINE FOR making pipe of from 2 inches to 12 or 15 inches diameter inside, for sewerage purposes, with socket joints on. Manufacturers of such will please correspond, stating price, &c., with P. BANNON, Terra Cotta Works, Louisville, Ky. 25 2*

TO SAW-MAKERS.—WANTED, A FOREMAN FULLY qualified to take the entire management of a saw factory. One who has occupied a similar position in some prominent manufactory preferred; or a half-interest in the factory would be sold to such a party on advantageous terms. The works have been long established and have a good reputation. Address Box 2,261, St. Louis, Mo. 25 2*

NERVOUS DISEASES AND PHYSICAL DEBILITY, arising from Specific causes, in both sexes—new and reliable treatment, in Reports of the Howard Association—sent in sealed letter envelopes, free of charge. Address Dr. J. SKILLIN HOUGHTON, Howard Association, No. 2 South Ninth street, Philadelphia, Pa. 25 4*

YOU CAN GET MACHINERY MADE BY CONTRACT or Days' Work, better and cheaper at 107 East 22d street, New York, than at any other place in this country. 1*

IMPORTANT TO OWNERS OF STEAM POWER. Send stamp for particulars. DAVID NORNBUT, Syracuse, N.Y. 1*

AGENTS WANTED IN EVERY PART OF THE country to sell rights of the best paying patent in the market. For sample, &c., address B. F. NORTON, Manchester, N. H. 25 3*

FLAGS! FLAGS!! FLAGS!!! FLAGS!!!! JAMES E. SEBRING (agent), Flag-maker, No. 27 Courtland street, New York. All sizes and descriptions made to order at the shortest notice. 25 4*

© 1863 SCIENTIFIC AMERICAN, INC.

PROVOST MARSHAL GENERAL'S OFFICE,
WASHINGTON, May 22, 1863.

NOTICE—THE ATTENTION OF ALL OFFICERS, who have been honorably discharged on account of wounds or disability, and who desire re-enter the service in the Invalid Corps, is called to the provisions of General Orders, No. 105, of 1863, from the War Department, published in the papers throughout the country. Such officers are requested to comply promptly with the provisions of that order, and to send their written applications, as therein provided, for positions in the Invalid Corps (stating the character of their disability), with as little delay as possible, to the Acting Assistant Provost Marshal General of the State in which they may be. Such Acting Assistant Provost Marshal General will at once forward the applications, with his indorsement, to the Provost Marshal General at Washington.

Officers for the Invalid Corps will be appointed immediately upon furnishing the papers required by General Orders, No. 105, of 1863, from the War Department. Their pay and emoluments will commence from date of accepance of such appointments, and not from date of organization of the respective commands to which they may be assigned.

J. B. FRY,
24 4 Provost Marshal General.

PROVOST MARSHAL GENERAL'S OFFICE.
WASHINGTON, D. C., May 22, 1863.

ALL MEN WHO DESIRE TO JOIN ANY PARTICULAR Regiment of Cavalry now in the field, are hereby authorized to present themselves at any time during the next thirty days to the Board of Enrolment in their respective Districts. The Board shall examine them, and determine upon their fitness for the Service, and if found to be fit, the Provost Marshal of the District shall give them transportation tickets to the general Rendezvous, at the Headquarters of the A. A. Provost Marshal General of the State. As soon as they present themselves at this general Rendezvous they shall be duly mustered by a mustering and disbursing officer, and paid by him the bounty allowed by law.

JAMES B. FRY,
23 4 Provost Marshal General.

DR. S. B. SMITH'S SENSATIONAL-DIRECT AND To-and-fro Current Electro-magnetic Machines. The inventor and patentee of this Sensational-direct Current, in combination with the To-and-fro Current, has seen various instruments claiming to have a Direct Current, none of which, however, have a Sensational-direct Current, and, consequently, materially, are of no value. These instruments are used with signal success in the cure of all nervous diseases, such as Neuralgia, Paralysis, St. Vitus' Dance, Epilepsy, &c., in Rheumatic Affections, Dropsy, Costiveness, Suppressed Menstruation; and for dentists it is a valuable anæsthetic in extracting teeth. For persons advanced in life, where the energies of nature are failing, the patent agent imparts new vigor to the system; and, as the drooping flowers of the field, after a refreshing shower, regain their prestine vigor, so does man, under the reviving influence of this mysterious and life-imparting current, regain the vigor of youth and the buoyancy of spirit which accompanies it. There is little doubt but that the daily use of this refreshing stimulant would prolong the life of man much beyond its usual period, and make his exit from the world an easy passage into eternity. The instrument is put up in a neat, highly-polished, portable black walnut case. The zincs never require cleaning, and will run constantly at an expense of 50 cents a year. Price, with single cup battery, $12; double cup, $15. A book with instructions is furnished with each machine. Orders promptly executed. Payment can be made to Express Agent on delivery of goods. Address Dr. S. B. SMITH, 429 Broadway, New York. 24 2*

"NOSES"—THEIR SIGNIFICANCE. ILLUSTRATED with engravings of the Roman, Grecian, Indian, Negro, Celestial, Aquiline, Turn-up and Pug Noses, with the character revealed by each. Eyes, large or small, blue, black or gray. Lips, thin and pale, or full and red, straight or curved, prim or pouting, sensual or refined, scolding or loving. Mouth, large or small. Hair, light or dark, coarse or fine, straight or curly. Cheeks, thin or plump, pale or colored. Teeth, large, small, long or short, regular or irregular. Ears, large or small. Neck, long, thin, short or thick. Skin, hard or soft, rough or smooth. All to be amply illustrated. The walk, talk, laugh and voice indicate character. We may know an honest face from a dishonest one, and we propose to show how. Besides the above, which embraces but one department, we shall treat of Ethnology, or the Natural History of Man; of Physiology, and the Laws of Life and Health; of Phrenology, the Philosophy of Mind; of Psychology, the Science of the Soul. Man, with reference to all his relations of life—social, intellectual and spiritual—will be elucidated in the PHRENOLOGICAL JOURNAL AND LIFE ILLUSTRATED. New volume commences July 1st. A handsome quarto monthly, at $1 50 a year. Sample numbers, 15 cents. Please address FOWLER & WELLS, 308 Broadway, New York. 24 2*

GILLESPIE'S GOVERNOR AND REGULATOR.—THE attention of mill-owners and others is invited to this valuable improvements for regulating the speed of water wheels and steam engines, for which purpose it has never been equaled. Unlike other regulators of water wheels, it is quick and very sensitive. It will move the heaviest gate from one extreme to the other in four or five seconds, if required, always stopping it exactly at the point that the labor requires. It is very simple in its construction, as can be seen by reference to page 328 current volume of the SCIENTIFIC AMERICAN (May 23). All who are troubled with unsteady power can be relieved from all trouble and anxiety, whether using steam engine or water wheel. This Governor, from its peculiar nature, will produce the same speed to a hair, whether the engine be laboring to its full capacity or running entirely free, and we guarrantee the Governor to act quicker than the labor can possibly be changed. For furthur particulars send for descriptive circular to J. E. GILLESPIE & CO., Trenton, N. J. Messrs. Hanson & Allen, Amsterdam, N. Y., are agents for Central and Western New York. 24 4*

OIL! OIL! OIL
For Railroads, Steamers, and for Machinery and Burning. PEASE'S Improved Engine and Signal Oil, indorsed and recommended by the highest authority in the United States. This Oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough and practical test. Our most skillful engineers and machinists pronounce it superior to and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The SCIENTIFIC AMERICAN, after several tests, pronounces it "superior to any other they have ever used for machinery." For sale only by the Inventor and Manufacturer, F. S. PEASE, No. 61 Main street, Buffalo, N. Y.

N.B.—Reliable orders filled for any part of the United States and 24 13*

SCIENTIFIC BOOKS AND PERIODICALS IMPORTED to order, by the single volume or in quantity—orders forwarded as often as once a week—by JOHN WILEY, 535 Broadway, New York. *** Architects, engineers and others desiring catalogues can have them forwarded gratis by sending their addresses as above. 24 4*

250 RARE RECEIPTS—ONE HUNDRED OF THESE receipts cost over a thousand dollars. The book sent by mail for fifteen cents. HUTCHINSON & CO., Publishers, 442 Broadway, New York. 24 6*

THE GREAT AMERICAN PUMP! FIVE YEARS' success in all parts of the world! Prices unchanged. The best pump for cisterns, wells, machinery, &c.—raises from all depths—forces to all distances—throws 75 feet by hose—simple, cheap and durable. Drawings and prices sent free. JAMES M. EDNEY, 474 Broadway, New York. 24 4*

DUDGEON'S PATENT HYDRAULIC PRESSES AND Boiler Punches. ENEAS DUDGEON, Eighth street, near Mission street, San Francisco, Cal. 24 4*

FANCY PIGEONS AND POULTRY—ALL KINDS for sale. Address Box 2,600 Post-office, Boston, mass. 24 4*

POWER LOOM WIRE CLOTHS AND NETTINGS, superior in quality and at low prices, by the CLINTON WIRE CLOTH COMPANY, Clinton, Mass. vol 8 24 3t*

FOR SALE.—A PATENT GRANTED ON MARCH 17, 1863. Described in the SCIENTIFIC AMERICAN, Vol. VII., No. 20. A spring skate which is light and durable, with an improved revolving heel screw. Samples can be seen at Walton's Skate Emporium No. 67 Warren street, or at the owner's, 178 Water street, New York.
25 10* JOSEPH M. YATES.

A VALUABLE WORK FOR INVENTORS, PATENTEES AND MANUFACTURERS.

The publishers of the SCIENTIFIC AMERICAN have just prepared, with much care, a pamphlet of information about Patents and the Patent Laws, which ought to be in the hands of every inventor and patentee, and also of manufacturers who use patented inventions. The character of this useful work will be better understood after reading the following synopsis of its contents:—

The complete Patent Law Amendment Act of 1861—Practical Instructions to Inventors, how to obtain Letters Patent, also about Models—Designs—Caveats—Trade-marks—Assignments—Revenue Tax—Extensions—Interferences—Infringements—Appeals—Re-issues of Defective Patents—Validity of Patents—Abandonment of Inventions—Best Mode of Introducing them—Importance of the Specification—Who are entitled to Patents—What will prevent the Granting of a Patent—Patents in Canada and European Patents—Schedule of Patent Fees; also a variety of miscellaneous items on patent law questions.

It has been the design of the publishers to not only furnish, in convenient form for preservation, a synopsis of the PATENT LAW and PRACTICE, but also to answer a great variety of questions which have been put to them from time to time during their practice of upwards of *seventeen years*, which replies are not accessible in any other form. The publishers will promptly forward the pamphlet by mail, on receipt of six cents in postage stamps.

Address MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, No. 37 Park Row, New York. 9

THE "KING MICROSCOPE"—DOUBLE LENS.—Prof. Horsford, of Harvard University, says: "It works very well, and you have got it up very neatly."—65 cents. The "S. WOODWARD," 38 cents; and the "BOWEN" microscopes, 28 cents. One each of the three kinds for $1. All free of postage. T. EDWIN KING, Evans' Hall, No. 3 Tremont Row, Boston, Mass. 23 4*

$40 PER MONTH AND EXPENSES. FOR PARTICULARS address (with stamp) HARRIS BROTHERS Boston, Mass. 23 tf

IMPORTANT TO THOSE USING STEAM BOILERS.—Blake's Patent Self-regulating Apparatus for supplying boilers with water. It keeps the water at a uniform hight against any pressure. Very simple and sure. All interested can see them in operation at our works, or circulars describing them will be sent by mail. BLAKE & WHEELOCK, 71 Gold street, New York. State rights sale. 23 8*

PLATINA! ALL SHAPES! FOR ALL PURPOSES. Imported by SUTTON & RAYNOR, 748 Broadway, New York. 23 2*

FLAX, HEMP, JUTE AND MANILLA.—RICHARD KITSON, Lowell, Mass., manufacturer of needle-pointed card clothing for carding flax, hemp, jute and manilla. 21 13

COMBINED HAND-TRUCK AND BAG-HOLDER.—IT should be in every mill, warehouse and barn. Price only $5. One truck, and patent for a county, $30. A township and a truck, $10. Patent for all the States except Pennsylvania for sale. Circulars free. J. R. Hoffer, Mount Joy, Pa. 23 4*

$75 A MONTH! I WANT TO HIRE AGENTS IN every county at $75 a month, expenses paid, to sell my new cheap Family Sewing Machines. Address S. MADISON, Alfred, Maine 21 13*

THE CELEBRATED CRAIG MICROSCOPE WILL BE mailed, prepaid, for $2 25; with 6 beautiful mounted objects for $3; with 24 objects for $5, by HENRY CRAIG, 180 Center street (3d floor), New York. Liberal discount to dealers.

"The Craig Microscopes are just what they claim to be, and those who wish for such an article will not be disappointed if they should obtain one of these."—*N. Y. Methodist.* 19 13*

FOR SALE.—THE UNDERSIGNED OFFER FOR SALE the whole, or family, town, county and state rights of J. K. Baer's patent for manufacturing wine—cheap, healthy, good keeping and very agreeable to drink. Address L. BAER, or JOHN BLATTNER, Highland, Madison county, Ill. 22 4*

A SCHOOL FOR DISTILLERS—PARTNER WANTED.—The advertiser desires to establish a small model distillery upon the plan and principles indicated in his articles published in Nos. 9, 10, 11, 12, 13 and 14, current volume of SCIENTIFIC AMERICAN, if he can secure the co-operation of some gentleman possessing a sufficient capital. Address L. SMITH, 15 North Maine street, St. Louis, Mo. 22 4*

$60 A MONTH! WE WANT AGENTS AT $60 A month, expenses paid, to sell our Everlasting Pencils, Oriental Burners, and thirteen other new, useful and curious articles. Fifteen circulars sent free. Address SHAW & CLARK, Biddeford, Maine. 21 11*

PECK'S PATENT DROP PRESS.—ALL THE SIZES used in the manufacture of silver, brass or tinware, lamps, spoons, jewelry, &c.; also for forging purposes, on hand or made to order, by MILO, PECK & CO. New Haven, Conn. 22 13*

LENNIG & MITCHELL, UNION MACHINE WORKS, 1,615, 1,617 and 1,619 Francis Street, above Ridge Avenue, Philadelphia, Pa. JOSEPH LENNIG and T. M. MITCHELL. 22 4*

DAMPER REGULATORS.—GUARANTEED TO EFfect a great saving in fuel, and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms or flexible vessels of any kind. Orders promptly attended to, or information given, by addressing CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 5 Park Place, New York.
Responsible agents wanted. 16 26*

WORTHY THE NOTICE OF LARGE MANUFACTURERS, either in America or Europe. I ca nproduce a cheap, permanent and beautiful black dye that answers for cotton, silk and woolen goods, simple and easy. It is patentable, and to be sold. Apply (if by letter, enclose stamp) to M. A. BERK, 17 State street, Newark, N. J. 23 4*

STEVENSON'S JONVAL TURBINE WATER WHEELS, which gave the greatest useful effect over all others, at the trials at Philadelphia, are manufactured at the Novelty Iron Works. Address J. E. STEVENSON, 200 Broadway, New York. 24 4*

HARRISON'S GRIST MILLS—20, 30, 36 AND 48 inches diameter, at $100, $200, $300 and $400, with all the modern improvements. Also, Portable and Stationary Steam Engines of all sizes, suitable for said mills. Also, Bolters, Elevators, Belting, &c. Apply to S. C. HILLS, No. 12 Platt-street, New York. d

FOR WOODWORTH'S OR DANIEL'S PLANERS AND Sash Machinery address J. A. FAY & CO., or E. C. TAINTER, succeeding partner, Worcester, Mass. 22 & 25—2 & 5 Vol. 9 *

WATER WHEELS.—WARREN'S TURBINE WATER Wheel and Turbine Regulator are used successfully in over 500 extensive cotton and woolen mills, where the greatest economy in water is at stake. Send for illustrated pamphlet. Address ALONZO WARREN, Agent for American Water Wheel Company, No. 31 Exchange street, Boston, Mass. 24 8*

A MESSIEURS LES INVENTEURS—AVIS IMPORTant. Les Inventeurs non familiers avec la langue Anglaise et qui préféreraient nous communiquer leurs inventions en Français, peuvent nous addresser dans leur langue natalie. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seron tregues en confidence. MUNN & CO.,
SCIENTIFIC AMERICAN Office, No. 37 Park-row, New York.

THE CHEAPEST MODE OF INTRODUCING INVENTIONS.

INVENTORS AND CONSTRUCTORS OF NEW AND useful Contrivances or Machines, of whatever kind, can have their Inventions illustrated and described in the columns of the SCIENTIFIC AMERICAN on payment of a reasonable charge for the engraving.

No charge is made for the publication, and the cuts are furnished to the party for whom they are executed as soon as they have been used. We wish it understood, however, that no secondhand or poor engravings, such as patentees often get executed by inexperienced artists for printing circulars and handbills from, can be admitted into these pages. We also reserve the right to accept or reject such subjects as are presented for publication. And it is not our desire to receive orders for engraving and publishing any but good Inventions or Machines, and such as do not meet our approbation in this respect, we shall decline to publish.

For further particulars address—

MUNN & CO.,
Publishers o the SCIENTIFIC AMERICAN,
New York City.

FAN BLOWERS—DIMPFEL'S, ALDEN'S, McKENZIE'S and others, for Steamboats, Iron Works, Founderies, Smith Shops, Jewelers, &c., on hand for sale by LEACH BROTHERS, 86 Liberty street, New York. 15 13*

SOMETHING NEW! AGENTS WANTED!—OUR NEW fancy "Card Thermometer," "Hemmer & Shield" for hand sewing, "Improved Indelible Pencil" for marking linen, and 10 more novel, useful and indispensable articles selling rapidly New inventions sold on commission. For circulars and terms address RICE & CO., 37 Park-row, New York, Inventors and Agents' Deopt. 22tf

IRON PLANERS, ENGINE LATHES, DRILLS AND other machinists' tools, also three and four spindle Drills of superior quality, on hand and finishing, for sale low. For description and price address NEW HAVEN MANUFACTURING COMPANY, New Haven, Conn. 1tf

TO PERSONS ENGAGED IN MANUFACTURING ARTICLES used in Woolen Mills.—I desire to obtain the address of all persons engaged in manufacturing articles used in Woolen Mills, such as Reed-makers, Shuttle-makers, Bobbin-makers, Picker-makers, Comb-makers, &c.; also manufacturers of Patent Oil-cans, Patent Temples, Patent Heddles and all other patented articles used or connected with Woolen Mills. Parties interested please take notice and send their business card to THOMAS STIBBS, Dealer in Manufacturers' Supplies, Wooster, Ohio. 17 11*

VALUABLE DOCK PROPERTY FOR SALE.—THE subscriber offers for sale a valuable plot of ground on Newtown Creek, near Penny Bridge, in the city of Brooklyn. The property is very desirably situated in the Seventeenth Ward, Meeker avenue, a great thoroughfare, forming the southerly boundary of the premises. A valuable dock privilege of over 400 feet on Newtown Creek, renders the property very desirable for large manufacturing or storage purposes. Vessels of six or eight feet draft can navigate the creek at low tide, and of much greater capacity at high water. The upland and water privilege comprise about nineteen acres, and will be sold very cheap, and the terms of payment made liberal. For further particulars, address J. B. BULLOCK, attorney for the owners, No. 39 Nassau street, New York. 22tf

TO PHOTOGRAPHERS.—IMPROVED PHOTOGRAHIC Camera, Patented March 25, 1862, by A. B. WILSON (Patentee of the Wheeler and Wilson Sewing Machine), adapted to all photographic work; such as Landscapes, Stereoscopic Views, Carte Visites, Ambrotypes, &c. Can be used by amateurs and others from printed directions. Send for a circular. Address A. B. WILSON, Waterbury, Conn. 16tf

SOLID EMERY VULCANITE.—WE ARE NOW MANUfacturing wheels of this remarkable substance for cutting, grinding and polishing metals, that will outwear hundreds of the kind commonly used, and will do a much greater amount of work in the same time, and more efficiently. All interested can see them in operation at our warehouse, or circulars describing them will be furnished by mail.
NEW YORK BELTING AND PACKING CO.,
14 13 Nos. 37 and 38 Park-row, New York.

GUILD & GARRISON'S CELEBRATED STEAM Pumps—Adapted to every variety of pumping. The principal styles are the Direct Action Excelsior Steam Pump, the improved Balance Wheel Pump, Duplex Vacuum and Steam Pumps, and the Water Propeller, an entirely new invention for pumping large quantities at a light lift. For sale at Nos. 55 and 57 First street, Williamsburgh, and No. 74 Beekman street, New York.
1 tf GUILD, GARRISON & CO

MACHINE BELTING, STEAM PACKING, ENGINE HOSE.—The superiority of these articles, manufactured of vulcanized rubber, is established. Every belt will be warranted superior to leather, at one-third less price. The Steam Packing is made in every variety, and warranted to stand 300 degs. of heat. The Hose never needs oiling, and is warranted to stand any required pressure; together wit all varieties of rubber adapted to mechanical purposes. Directions, prices &c., can be obtained by mail or otherwise at our warehouse. NEW YORK BELTING AND PACKING COMPANY.
JOHN H. CHEEVER, Treasurer,
14 13 Nos. 37 and 38 Park-row New York

BLACK DIAMOND STEEL WORKS, PITTSBURGH, Pa. PARK, BROTHER & CO., manufacturers of best quality Refined Cast Steel, square, flat and octagon, of all sizes. Warranted equal to any imported or manufactured in this country. Office and Warehouse, Nos. 149 and 151 First street, and 120 and 122 Second street, Pittsburgh, Pa. vol. 8 11 1y*

PORTABLE STEAM ENGINES—COMBINING THE maximum of efficiency, durability and economy with the minimum of weight and price. They are widely and favorably known, more than 200 being in use. All warranted satisfactory or no sale. A large stock on hand ready for immediate application. Descriptive circulars sent on application. Address J. C. HOADLEY, Lawrence, Mass.
14 13

Zur Beachtung für deutsche Erfinder.

Die Unterzeichneten haben eine Anleitung, die Erfindern das Verhalten angibt, um sich ihre Patente zu sichern, herausgegeben, und verabfolgen solche gratis an dieselben.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu addressiren an

Munn & Co.,
37 Park Row, New York.

Auf der Office wird deutsch gesprochen.

Daselbst ist zu haben:

Die Patent-Gesetze der Vereinigten Staaten.

nebst den Regeln und der Geschäftsordnung der Patent Office und Anleitungen für den Erfinder, um sich Patente zu sichern, in den Ver. St. sowohl als in Europa. Ferner Auszüge aus den Patent Gesetzen fremder Länder und darauf bezügliche Rathschläge; ebenfalls nutzliche Winke für Erfinder und solche, welche patentiren wollen.

Preis 20 Cts., per Post 25 Cts.

© 1863 SCIENTIFIC AMERICAN, INC.

Improved Bank Lock.

The construction of locks has for a long time past exercised much of the inventive skill of the country, and so successfully that, as most of our readers know, we bore away the palm at the great Exhibition in London, held during the year 1851. Since that time we have made gratifying progress in this respect, and many ingenious locks for all purposes are offered for sale, including those for defending our street-doors from the intrusion of the sneak-thief, or for securely blockading the entrance to merchants' fire-proof safes against unlawful intrusion.

We give this week an illustration of an ingenious combination lock, which will be readily understood by referring to our description. The frame, A, is of brass or cast iron as may be desired; in it is the double bolt, B, all one casting, the catch, C, and the tumblers, D. The part marked, E, is simply the key-guide. The tumblers constitute the principal feature of the lock. They are so arranged with reference to the bolt, that when the key (Fig. 2) is thrust in the key-hole, they shut together on the ends, F, and disengage themselves from the square shoulders, *a*, against which they had thrust and prevented the bolts from being thrown back by the door-knob. The tumblers are all carried by the pins, *b*, on which they vibrate; they are twelve in number, four in each pile, and have springs, *c*, which keep them spread apart in the right position to hold the bolt when the key is withdrawn. By referring to the key it will be seen that there are a series of cam-grooves, A, on its face in which the ends of the tumblers slide; it is only necessary to thrust this key in the lock when the ends of the tumblers, accomodating themselves to the cam grooves, are all thrown out of connection with the bolt, and the door may be opened by turning the knob. When the key is withdrawn the springs throw the tumblers out in place again, and the door is locked.

This lock offers great protection against burglars, as it is said it cannot be picked. It can also be made powder-proof, and will last a long time. The key can be made very thin and light, so as to be carried in the vest-pocket. The changes that can be made in this lock are almost endless, as a simple alteration in the key and in the number of tumblers or levers, will render it utterly useless for the particular lock to which it belongs; and this feature affords additional security against unlawful invasion. This lock was patented on Nov. 1, 1859, by C. Duckworth of North Adams, Mass. The entire patent right is for sale. Further information can be had by addressing the inventor as above.

Fig. 1

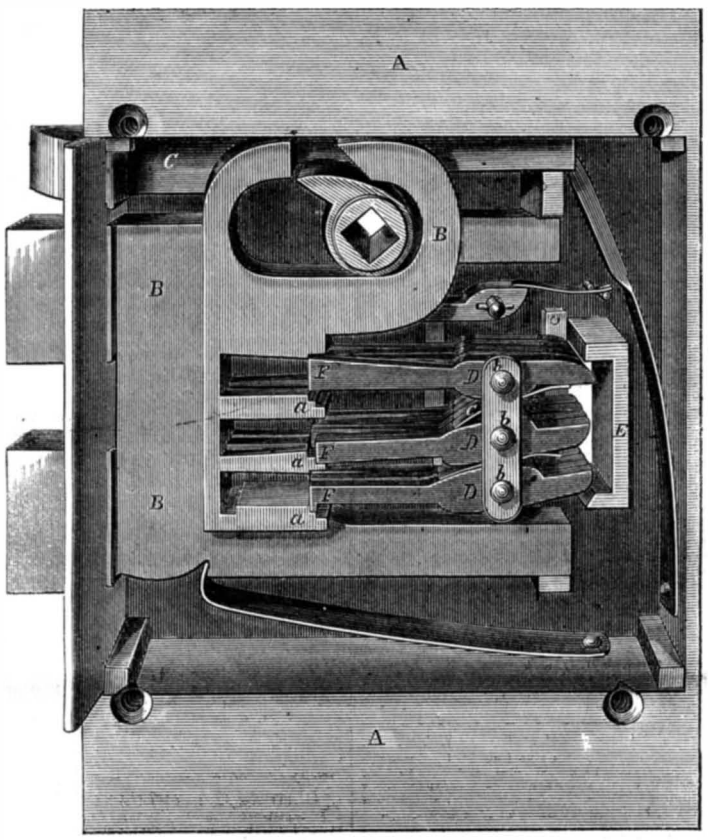


Fig. 2

DUCKWORTH'S PATENT LOCK.

The Electric Light in Surgery.

One of the greatest obstacles to the success of a surgical operation is the scanty and imperfect light which, in some cases, is the surgeon's only guide, and is fraught with danger to the patient. The problem, therefore, of finding a light which might be introduced into a cavity with impunity, remained still to be solved; but, from a communication which has been made to the French Academy of Sciences, lately, it would appear that this desirable object has at length been attained in the construction of an ingenious and efficient apparatus. M. Foussagrives, having long entertained the idea that the electric light might be advantageously applied to the purpose, communicated his views to M. Duomoncal, a distinguished electrician, who, calling to mind the effects of electricity in vacuo, conceived the following plan:—A glass tube, having a very small bore, is bent into the form of a helix or screw—the smaller the bore, the greater the brilliancy of light; by this means a kind of luminous cylinder being formed, which is sufficiently small to be conveniently introduced into a narrow cavity. In determining the color of the light, it was decided that as mixtures of certain gases, such as carbureted hydrogen, carbonic acid, hydrochloric acid, &c., will produce a white light, nothing remained but to fill the tube with such a mixture; this delicate operation was performed by M. Ruhmkorff, who also added other improvements to the apparatus.

PLUCK.—A young warrior in ancient times was observed to be seized with a sudden quaking and shivering all over his body; whereupon one asked him what the matter was. He replied "My flesh trembles at the forethought of those dangers whereunto my undaunted and resolved heart will certainly carry me."

THE London *Lancet* says:—"MM. Trousseau and Dumontpallier have been recently making some experiments with tincture of iodine as a test. This tincture, when added to urine which is acid, imparts a deep color to the fluid, and if the urine in jaundice be treated by some of the tincture, the green matter, termed biliverdine, is rendered very manifest."

PROSPECTUS

OF THE

SCIENTIFIC AMERICAN.

THE BEST MECHANICAL PAPER IN THE WORLD.

NINETEENTH YEAR!

VOLUME VIII.—NEW SERIES.

The publishers of this popular and cheap illustrated newspaper beg to announce that on the third day of January, 1863, a new volume commenced. The journal is still issued in the same form and size as heretofore, and it is the aim of the publishers to render the contents of each successive number more attractive and useful than any of its predecessors.

The SCIENTIFIC AMERICAN is devoted to the interests of Popular Science, the Mechanic Arts, Manufactures, Inventions, Agriculture, Commerce, and the Industrial pursuits generally, and is valuable and instructive not only in the Workshop and Manufactory, but also in the Household, the Library and the Reading Room.

The SCIENTIFIC AMERICAN has the reputation, at home and abroad, of being the best weekly journal devoted to mechanical and industrial pursuits now published; and the proprietors are determined to keep up the reputation they have earned during the eighteen years they have been connected with its publication.

To the Mechanic and Manufacturer!

No person engaged in any of the mechanical pursuits should think of doing without the SCIENTIFIC AMERICAN. It costs but six cents per week; every number contains from six to ten engravings of new machines and inventions which cannot be found in any other publication. It is an established rule of the publishers to insert none but *original* engravings, and those of the first class in the art, drawn and engraved by experienced artists, under their own supervision, expressly for this paper.

Chemists, Architects, Millwrights and Farmers!

The SCIENTIFIC AMERICAN will be found a most useful journal to them. All the new discoveries in the science of chemistry are given in its columns, and the interests of the architect and carpenter are not overlooked; all the new inventions and discoveries appertaining to those pursuits being published from week to week. Useful and practical information pertaining to the interests of millwrights and millowners will be found published in the SCIENTIFIC AMERICAN, which information they cannot possibly obtain from any other source. Subjects in which planters and farmers are interested will be found discussed in the SCIENTIFIC AMERICAN; most of the improvements in agricultural implements being illustrated in its columns.

To the Inventor!

The SCIENTIFIC AMERICAN is indispensable to every inventor, as it not only contains illustrated descriptions of nearly all the best inventions as they come, but each number contains an Official List of the Claims of all the Patents issued from the United States Patent Office during the week previous; thus giving a correct history of the progress of inventions in this country. We are also receiving, every week, the best scientific journals of Great Britain, France and Germany; thus placing in our possession all that is transpiring in mechanical science and art in those old countries. We shall continue to transfer to our columns copious extracts from those journals of whatever we may deem of interest to our readers.

TERMS.

To mail subscribers:—Three Dollars a Year, or One Dollar for four months. One Dollar and Fifty Cents pay for one complete volume of 416 pages; two volumes comprise one year. A new volume commenced on the third of January, 1863.

CLUB RATES.

Five Copies, for Six Months	$6
Ten Copies, for Six Months	12
Ten Copies, for Twelve Months	23
Fifteen Copies, for Twelve Months	34
Twenty Copies, for Twelve Months	40

For all clubs of Twenty and over the yearly subscription is only $2 00. Names can be sent in at different times and from different Post-offices. Specimen copies will be sent gratis to any part of the country.

Western and Canadian money or Post-office stamps taken at par for subscriptions. Canadian subscribers will please to remit 25 cents extra on each year's subscription to pre-pay postage.

MUNN & CO., Publishers,
Park Row, New York.

FROM THE STEAM PRESS OF JOHN A GRAY

© 1863 SCIENTIFIC AMERICAN, INC.